COMPAQ

ProLiant ML350

Maintenance and Service Guide

Fourth Edition (March 2002)
Part Number 122832-004
Spare Part Number 164275-001
Compaq Computer Corporation

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About This Guide

This maintenance and service guide is a troubleshooting guide that can be used for reference when servicing the *Compaq ProLiant*™ ML350 server.

WARNING: To reduce the risk of personal injury from electric shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Compaq Technician Notes

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module-level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.
- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

CAUTION: To properly ventilate the system, you must provide at least 30.5 cm (12 inches) of clearance at the front and back of the computer.

CAUTION: The computer is designed to be electrically grounded (earthed). To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

NOTE: Any indications of component replacement or printed wiring board modifications may void any warranty.

Where to Go for Additional Help

In addition to this guide, the following information sources are available:

- User documentation
- *Compaq Service Quick Reference Guide*
- Service training guides
- Compaq service advisories and bulletins
- Compaq QuickFind
- Compaq Insight Manager
- Compaq download facility: Call 281-518-1418

Integrated Management Log

The ProLiant ML350 server includes an integrated, nonvolatile management log that contains fault and management information. The contents of the Integrated Management Log (IML) can be viewed with Compaq Insight Manager or an IML Viewer for the supported operating system.

Telephone Numbers

For the name of your nearest Compaq authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.

For Compaq technical support:

- In the United States and Canada, call 1-800-386-2172.
- For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website:

  http://www.compaq.com

Chapter 1

Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and spare parts lists for the *Compaq ProLiant*™ ML350 server with Pentium III processor and a 133-MHz system bus. See Table 1-1 and Table 1-2 for the names of referenced spare parts.

Mechanical Parts Exploded View

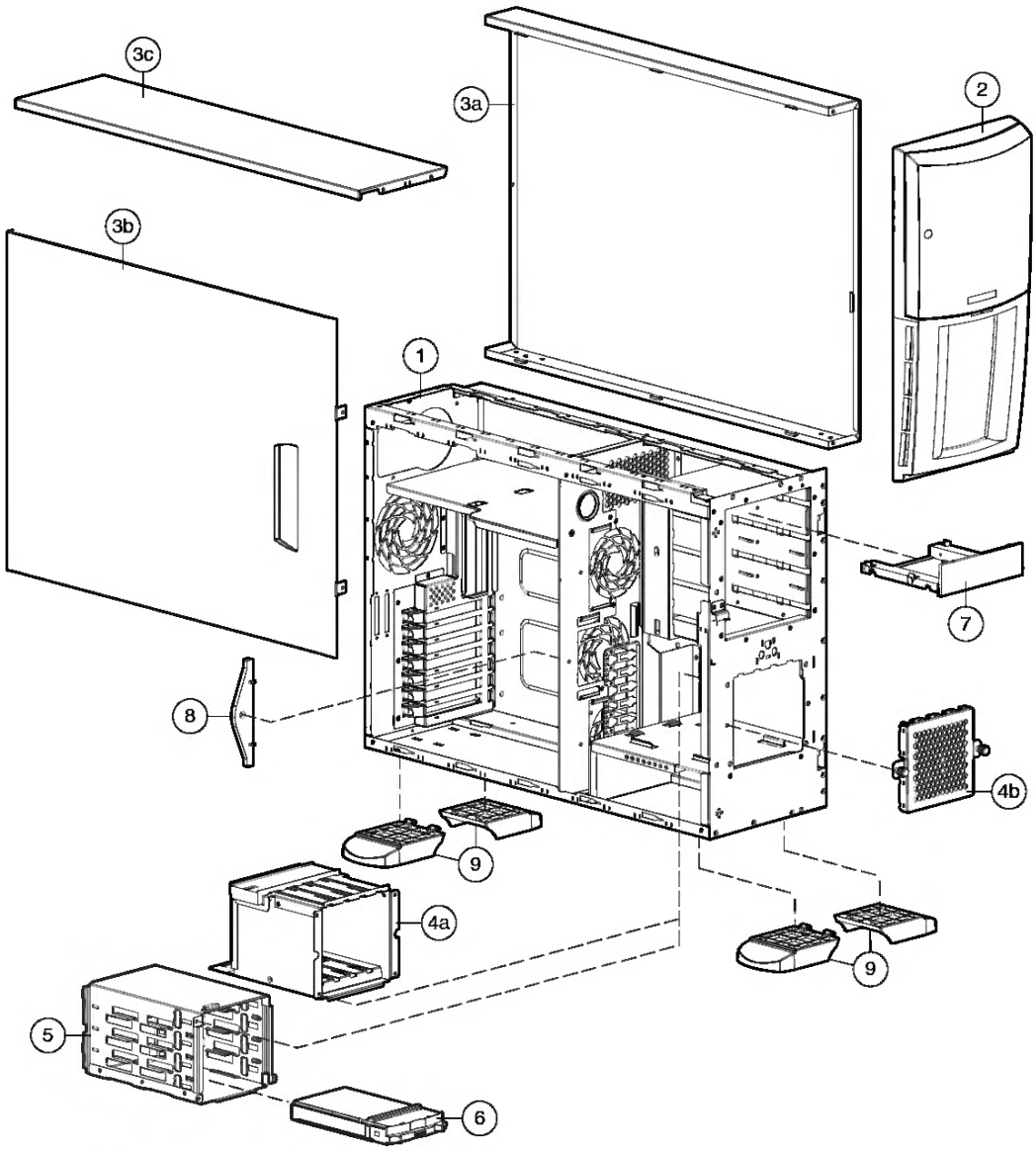


Figure 1-1. Mechanical parts exploded view

Mechanical Spare Parts List

Table 1-1
Mechanical Spare Parts List

Item	Description	Spare Part Number
	Chassis	
1	Chassis assembly	163358-001
2	Front bezel door	164274-001
3	Cover kit	163344-001
	a) Hood panel	
	b) Access panel	
	c) Top panel	
	d) SCSI knockout cover *	
	Miscellaneous	
4	Non-hot-plug hard drive cage **	163349-001
	a) Drive cage	
	b) Drive bay cover	
5	Hot-plug hard drive cage **	159137-001
6	Hot-plug drive blank	122759-001
7	Removable media blank ***	163345-001
8	Expansion board retainer ***	163345-001
9	Feet ***	163345-001

* Not shown

** The ProLiant ML350 server features either a hot-plug hard drive cage or a non-hot-plug hard drive cage.

*** Part of the plastics spare kit.

System Components Exploded View

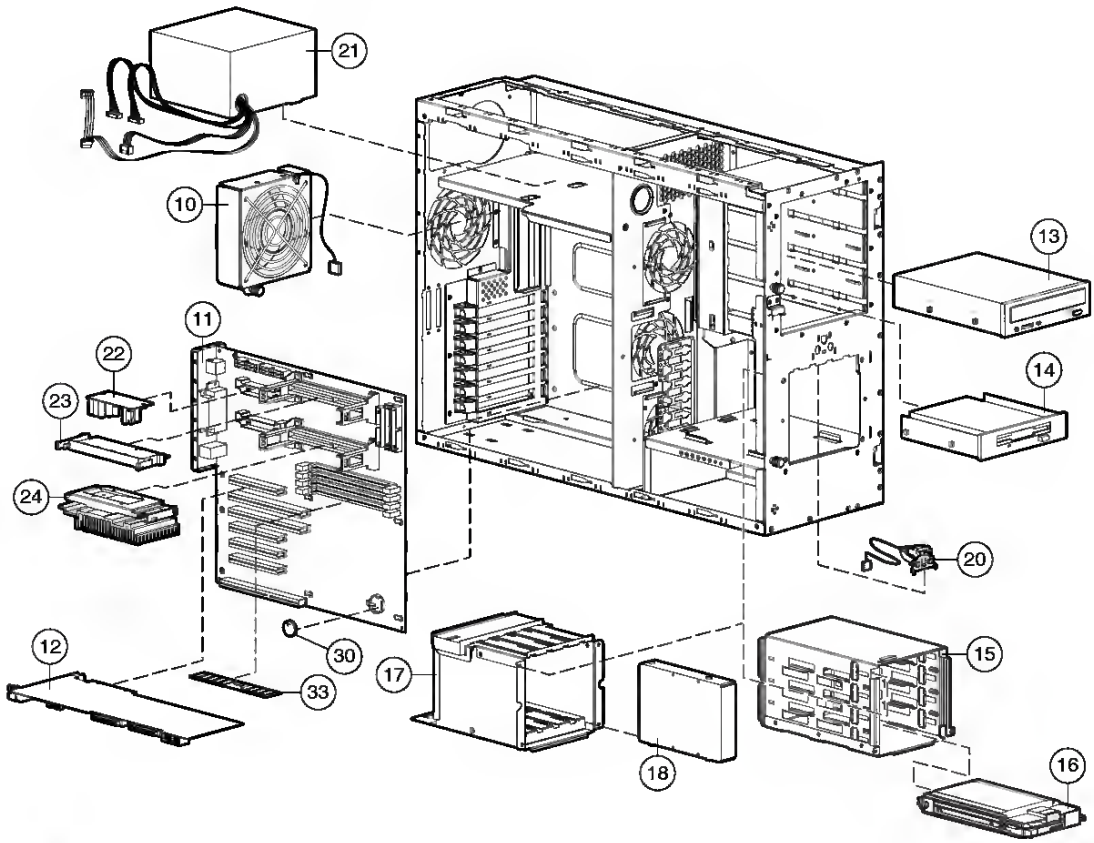


Figure 1-2. System components exploded view

System Components Spare Parts List

Table 1-2
System Components Spare Parts List

Item	Description	Spare Part Number
	System Components	
10	System fan module	163347-001
	Boards	
11	System board	163357-001
12	Server Feature Board (expansion board)	163355-001
	Mass Storage Devices	
13	CD-ROM drive	
	■ 32X IDE CD-ROM drive	163354-001
	■ 40X IDE CD-ROM drive *	179963-001
14	Diskette drive	158601-001
15	Hot-plug hard drive cage **	159137-001
15a	4-slot SCSI drive cage simplex backplane board*	387090-001
16	9.1-GB Wide Ultra2 SCSI hot-plug hard drive	122759-001
17	Non-hot-plug hard drive cage **	163349-001
18	9.1-GB Wide Ultra2 SCSI non-hot-plug hard drive **	349534-001
19	Hot-plug drive blank * **	104665-001
	Power	
20	Power switch assembly	163350-001
21	300 W PFC power supply	163346-001
22	Processor Power Module	157825-001
23	Processor terminator module	158271-001
	Dptions	
24	Pentium III processor 600/133 EB with heatsink	166146-001
25	Pentium III processor 667/133 with heatsink *	166145-001
26	Pentium III processor 733/133 with heatsink *	164272-001
27	Pentium III processor 800/133 with heatsink *	187781-001
28	Pentium III processor 866/133 with heatsink *	187782-001
29	Pentium III processor 933/133 with heatsink *	196628-001
30	CR2032 lithium battery for system board and Server Feature Board	234556-001

* Not shown

** Also referenced in Figure 1-1 and Table 1-1

continued

Table 1-2
System Components Spare Parts List *continued*

Item	Description	Spare Part Number
	Options continued	
31	512-MB PC 133-MHz ECC Registered SDRAM DIMM *	159227-001
32	256-MB PC 133-MHz ECC Registered SDRAM DIMM *	159304-001
33	128-MB PC 133-MHz ECC Registered SDRAM DIMM	159226-001
34	64-MB PC 133-MHz ECC Registered SDRAM DIMM *	159225-001
	Miscellaneous	
35	Enhanced keyboard *	386209-001
36	Signal cable kit *	163353-001
	a) IDE ribbon cable assembly	
	b) Diskette drive cable assembly	
	c) SMIC cable assembly	
	d) Removable media device SCSI cable	
37	SCSI LVD cable *	163351-001
38	Miscellaneous plastics kit *	163345-001
	a) PCI retainer	
	b) Foot, plastic, chassis	
	c) Removable media blank	
	d) 5.25-inch drive bay bezel	
	e) Retainer clips	
	f) Expansion board retainer	
39	Tower-to-rack conversion kit *	164277-001
	a) Front plate, rack	
	b) Mounting hardware kit	
	c) Non-hot-plug drive cage door	
40	Return kit *	164270-001
41	Country kit *	164271-001
42	Maintenance and service guide *	164275-001
43	Illustrated parts map *	164276-001

* Not shown

** Also referenced in Figure 1-1 and Table 1-1

Chapter 2

Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the ProLiant ML350 server. Run the diagnostics program to verify that all components operate properly.

To service the ProLiant ML350 server, you might need the following:

- Torx T-15 screwdriver
- From the Compaq SmartStart and Support Software CD:
  - Array Diagnostics Utility (ADU)
  - Diagnostics software

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded (earthed) tools and equipment.
- Keep work area free of nonconductive materials, such as ordinary plastic assembly aids and foam packing.
- Make sure you are always properly grounded (earthed) when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives with the PCB-assembly-side down.
- Use conductive field service tools.

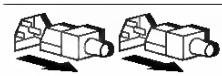
Symbols on Equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:

	This symbol in conjunction with any of the following symbols indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.
	This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel. **WARNING:** To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.
	This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason. **WARNING:** To reduce the risk of injury from electric shock hazards, do not open this enclosure.
	This symbol on an RJ-45 receptacle indicates a Network Interface Connection. **WARNING:** To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



These symbols on power supplies or systems indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

Weight in kg
Weight in lb

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

WARNING: This label or equivalent is located on the surface of the CD-ROM drive. This label indicates that the product is classified as a CLASS LASER PRODUCT.

Preparation Procedures

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard.

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded (earthed) before beginning any installation procedure. See "Electrostatic Discharge" earlier in this chapter for more information.

Before beginning any removal and replacement procedure for non-hot-plug devices:

1. Power down the ProLiant ML350 server and any peripheral devices.
2. Disconnect the AC power cord from the AC outlet, and then disconnect from the server.
3. Disconnect all external peripheral devices from the server.

NOTE: If you have installed a rack upgrade kit, you must remove the ProLiant ML350 server from the rack and place it on a sturdy table or workbench. Refer to the *Compaq ProLiant ML350 Setup and Installation Guide* for instructions.

Rack Warnings

WARNING: To reduce the risk of personal injury or damage to the equipment:

- Always load the heaviest item first, and load the rack from the bottom up. This step makes the rack "bottom-heavy" and helps prevent the rack from becoming unstable.
- The bottom stabilizers on the equipment must be fully extended. Be sure that the equipment is properly supported/braced when installing options and cards.
- Extend only one component at a time. A rack may become unstable if more than one component is extended for any reason. Be sure that the rack is adequately stabilized before extending a component outside the rack.
- Before beginning work on the rack, be sure that the leveling jacks are extended to the floor, that the full weight of the rack rests on the level floor, and that either stabilizers are installed or multiple racks are coupled for stability.
- Because the rack allows you to stack computer components on a vertical rather than horizontal plane, you must take precautions to provide for rack stability and safety and to protect both personnel and property. Heed all cautions and warnings in the installation instructions that come with the server.
- Tipping can cause injury or death.

WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack.

Server Warnings and Precautions

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

CAUTION: The server must always be operated with system unit covers on. Proper cooling is not achieved if the system unit covers are removed.

Front Bezel Door

CAUTION: Before removing the front bezel door, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

To remove the front bezel door:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. If the keylock is locked, unlock using the included key (1).
3. Open the front bezel door fully to the right (2)
4. Lift the bezel door upward (3), and then away from the chassis

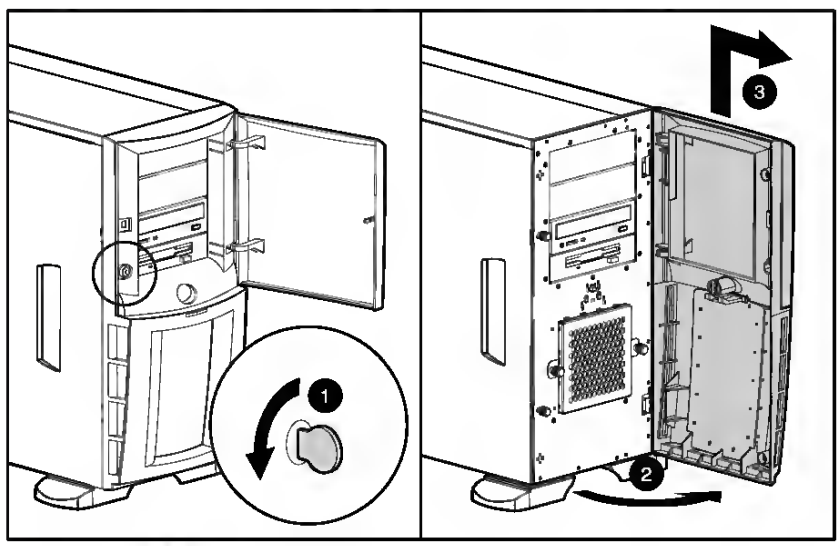


Figure 2-1. Removing the front bezel door

Reverse steps 1 through 4 to replace the front bezel door.

NOTE: When replacing the front bezel door, ensure that the bottom hinge points are properly placed in the chassis before rotating the front bezel door back into its original position.

Access Panel

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

CAUTION: Before removing the access panel, make sure that the server is powered down, all cables are disconnected from the back of the server, and the power cord is disconnected from the grounded (earthed) AC outlet.

CAUTION: Do not operate the server with the large access panel removed. This panel is an integral part of the cooling system and removing it while the system is running may cause overheating and subsequent server shutdown.

To remove the access panel:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Open the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Loosen the two thumbscrews (1) located on the front of the access panel.
4. Slide back the access panel (2) approximately 2.5 cm (1 inch). Then remove the panel.

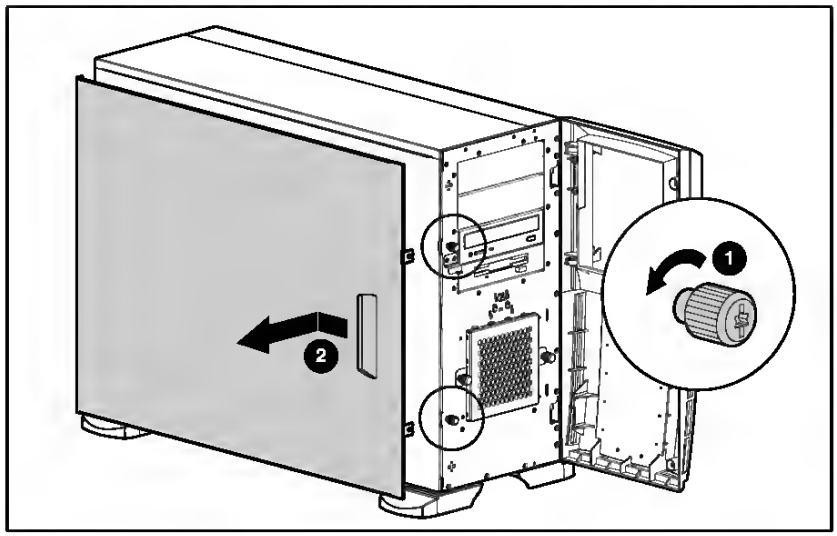


Figure 2-2. Removing the access panel

Reverse steps 1 through 4 to replace the access panel.

Removable Media Blank

NOTE: The removable media blank must be removed from an available removable media bay to install a storage device for the first time.

To remove a removable media blank from the front bezel:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. While pushing up on the drivelock (1), push on the rear of the removable media blank assembly.
5. Gently remove the removable media blank (2).

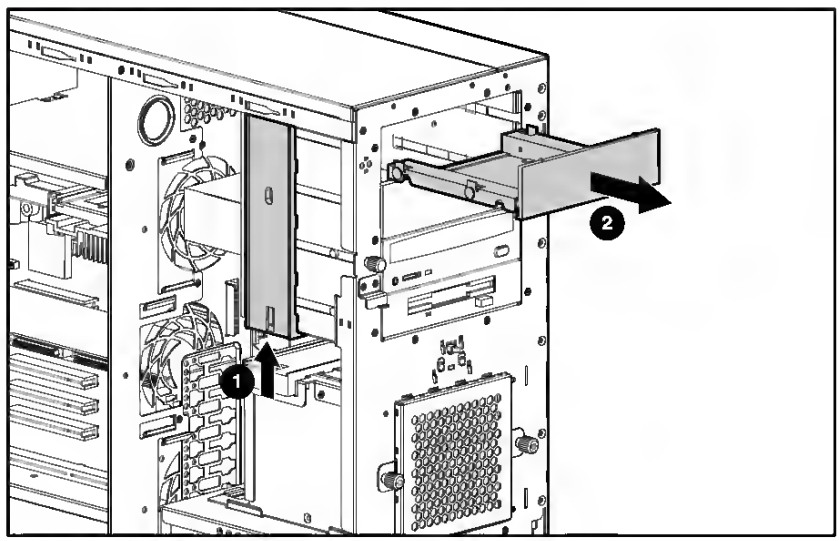


Figure 2-3. Removing the media blank

Reverse steps 1 through 5 to replace the removable media blank.

Cable Routing Diagrams

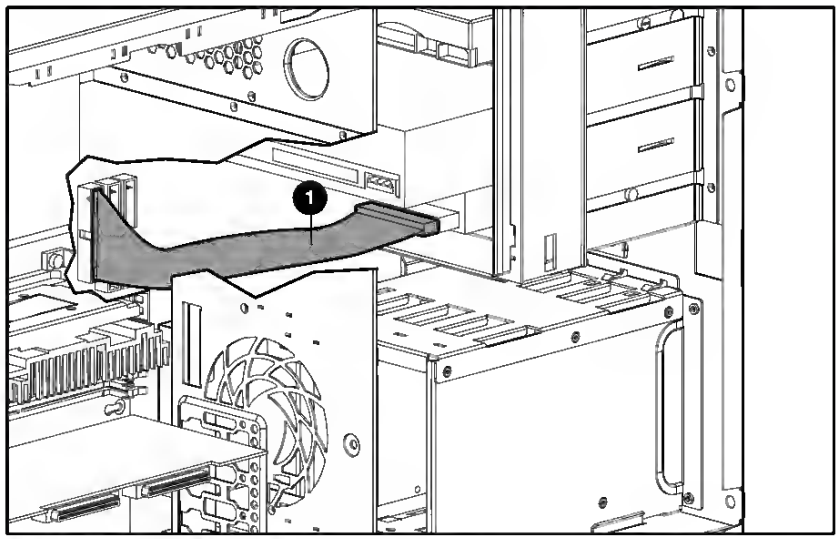


Figure 2-4. 1.44-MB diskette drive cable (1)

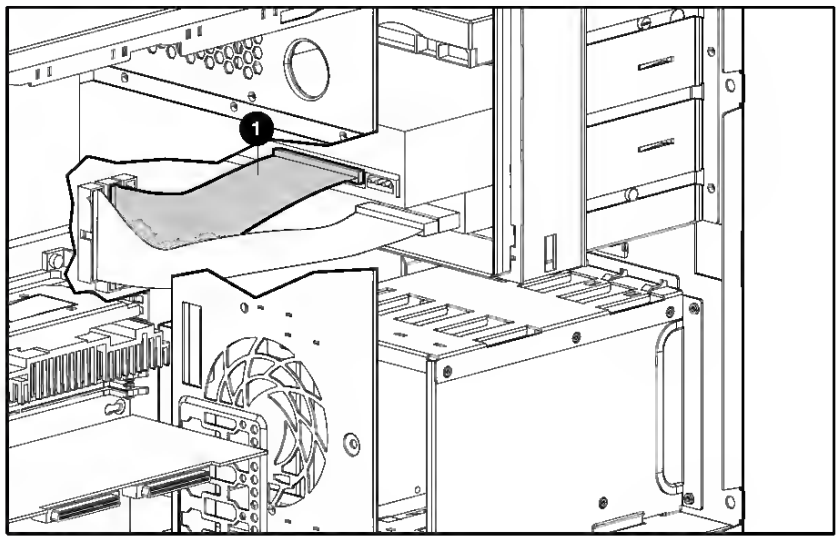


Figure 2-5. IDE CD-ROM drive cable (1)

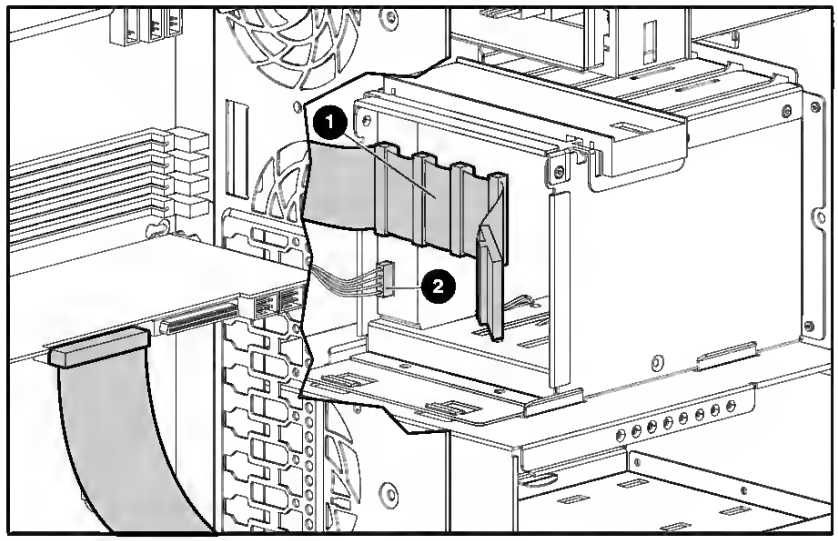


Figure 2-6. Four-device SCSI cable (1) and power cable (2)

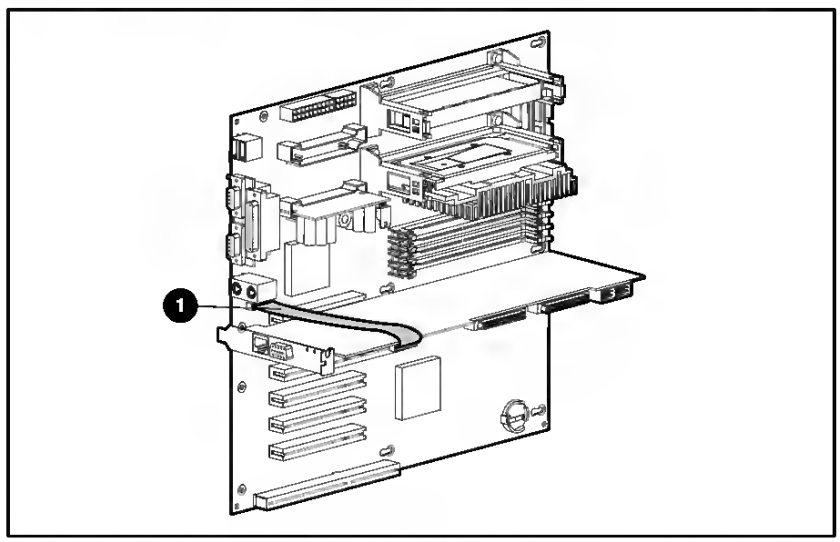


Figure 2-7. Server Management Information Cable (SMIC) (1)

System Fan Module

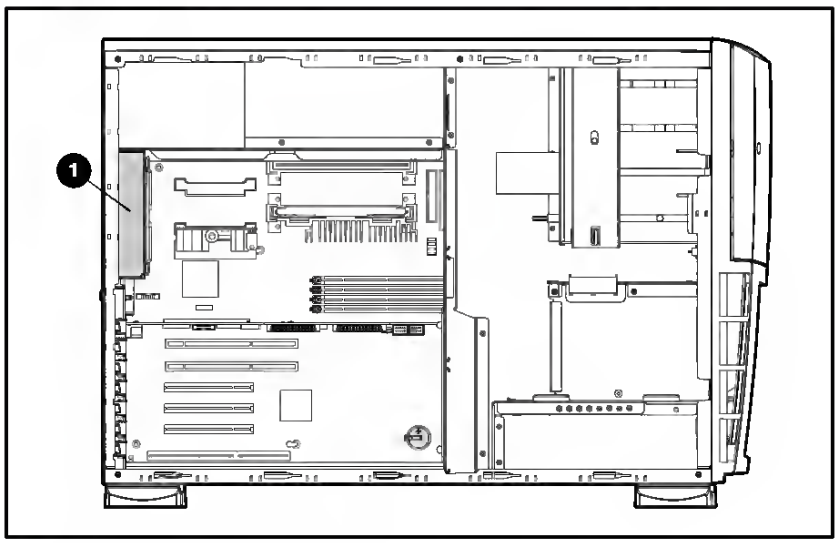


Figure 2-8. System fan module location

Table 2-1
System Fan Location

Item	Description
1	System fan module

To remove the system fan module:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Disconnect the fan cable (1) from the system board.

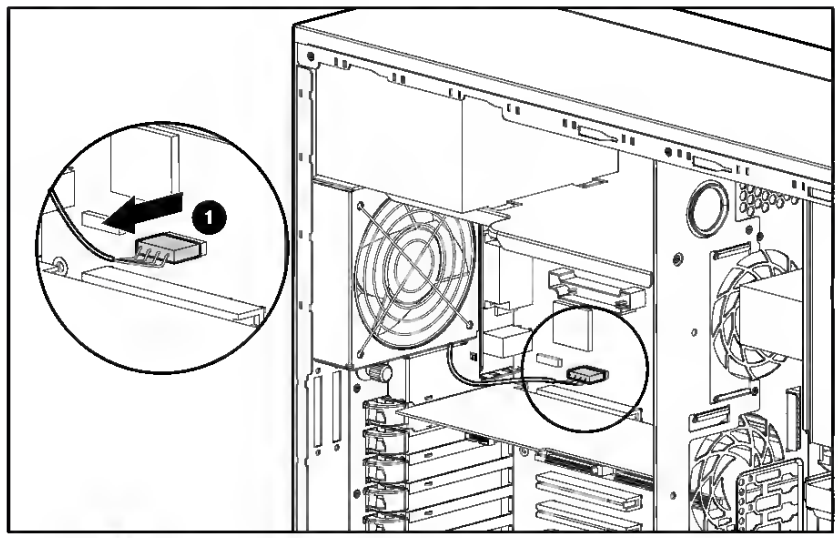


Figure 2-9. Disconnecting the system fan module cable

4. Loosen the thumbscrew (2) securing the fan module to the chassis.
5. Rotate the fan module (3) counterclockwise, then remove the system fan module from the chassis.

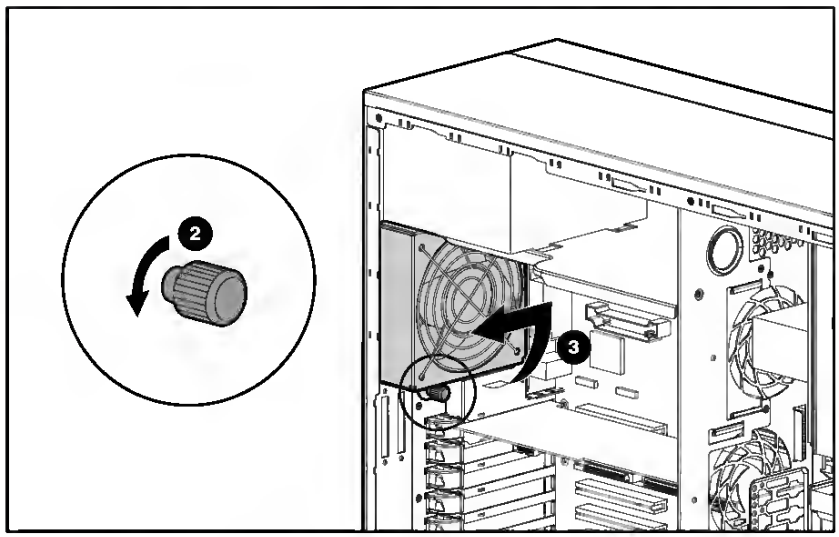


Figure 2-10. Removing the system fan module

Reverse steps 1 through 5 to replace the system fan module.

Drive Bay Configuration

The ProLiant ML350 server supports a maximum of eight internal drive bays (four are removable media drives, four are hard drives). Figure 2-11 and Table 2-2 show the drive bay configurations.

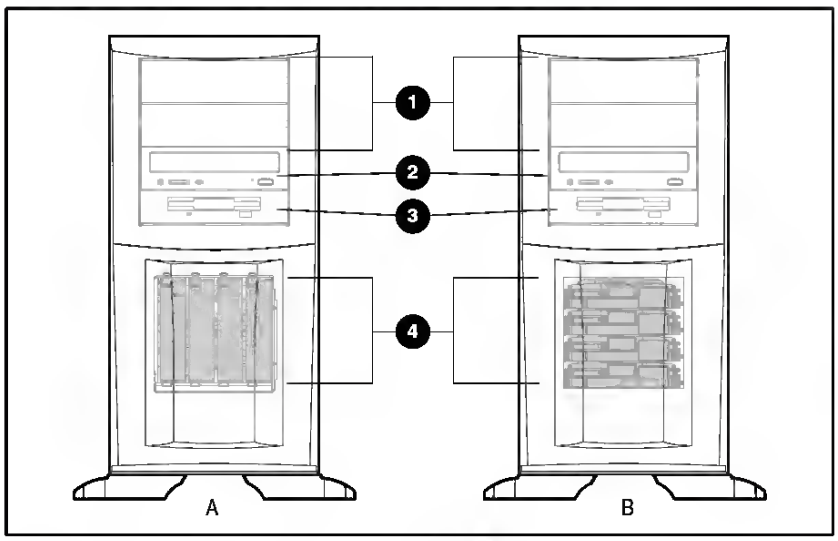


Figure 2-11. ProLiant ML350 server drive bay configurations

Table 2-2
Drive Bay Configurations

Item	A: Non-Hot-Plug Configuration	B: Hot-Plug Configuration
1	Empty removable media bays	Empty removable media bays
2	IDE CD-ROM drive	IDE CD-ROM drive
3	1.44-MB diskette drive	1.44-MB diskette drive
4	Non-hot-plug hard drive bays	Hot-plug hard drive bays

NOTE: The removable media drive bays can be occupied by any half-height device, such as a 12/24 DAT tape drive.

Non-Hot-Plug Hard Drive

To remove the non-hot-plug hard drive:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect the data cables (1) and power cables (2) from the back of the drive.

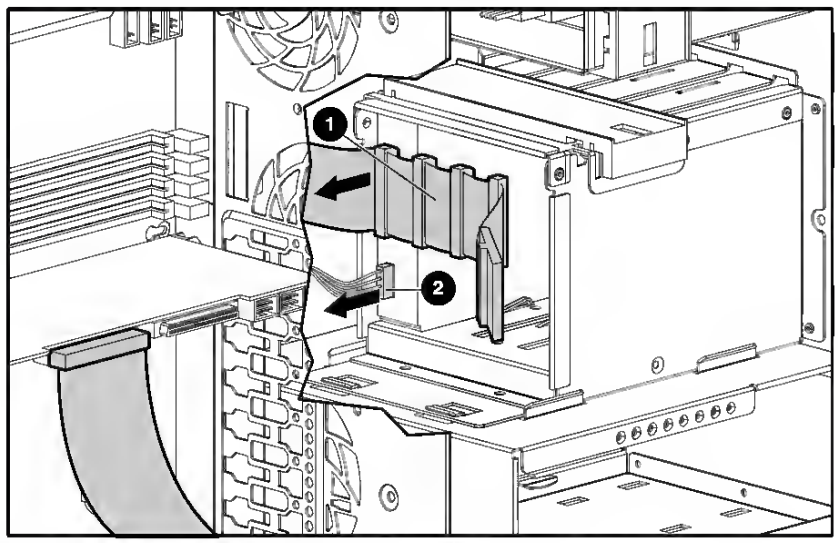


Figure 2-12. Disconnecting the non-hot-plug hard drive cables

5. For systems equipped with a drive bay cover, loosen the thumbscrews (1), then remove the drive bay cover (2).

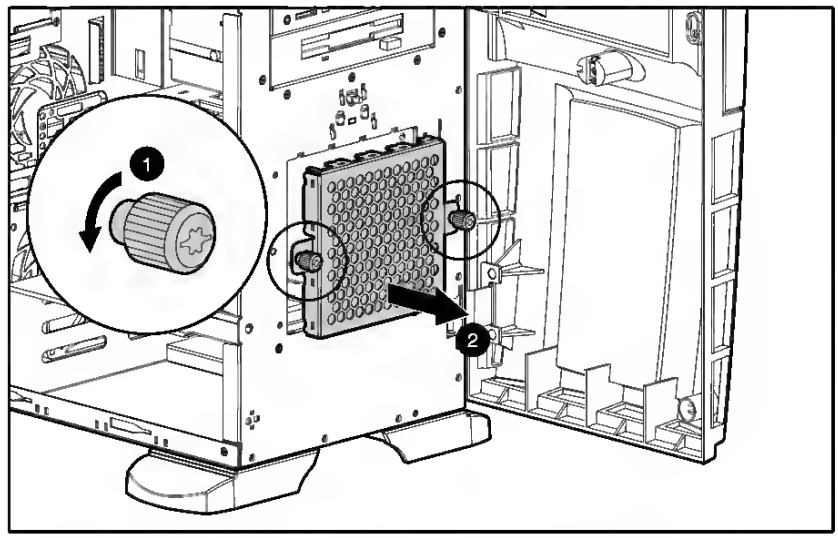


Figure 2-13. Removing the drive bay cover from a non-hot-plug hard drive cage

6. While pushing in on the drivelock (1), pull the drive (2) out of the drive bay.

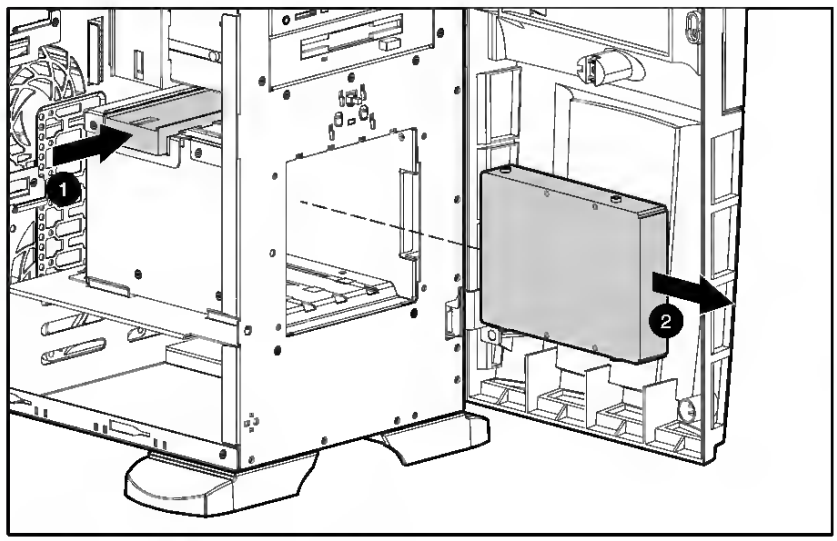


Figure 2-14. Removing a non-hot-plug hard drive

7. With a Torx T-15 screwdriver, remove the guide screws from the hard drive.

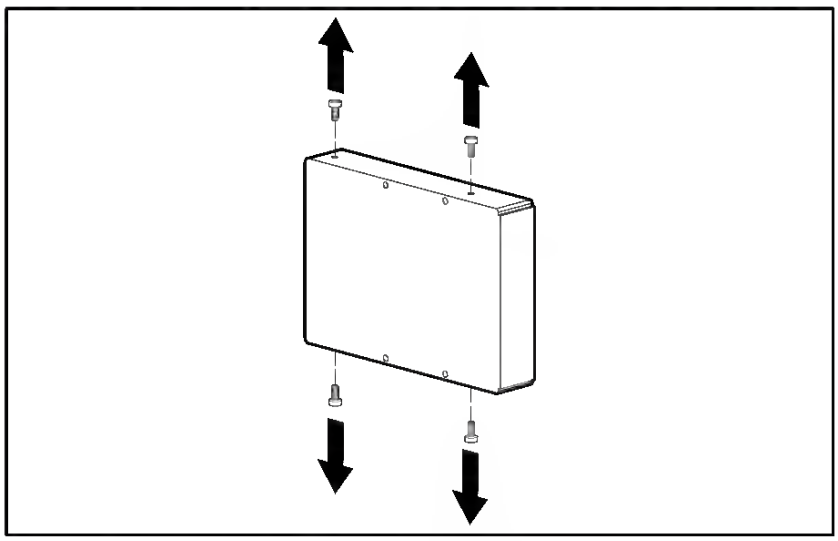


Figure 2-15. Removing guide screws from the non-hot-plug hard drive

Reverse steps 1 through 7 to replace a non-hot-plug hard drive.

Non-Hot-Plug Hard Drive Cage

To remove a non-hot-plug hard drive cage:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Open the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Ensure that all cables are disconnected from the bard drives.
5. Loosen the thumbscrews (1), and then remove the drive bay cover (2).
6. Remove all bard drives. See "Non-Hot-Plug Hard Drive" earlier in this chapter.

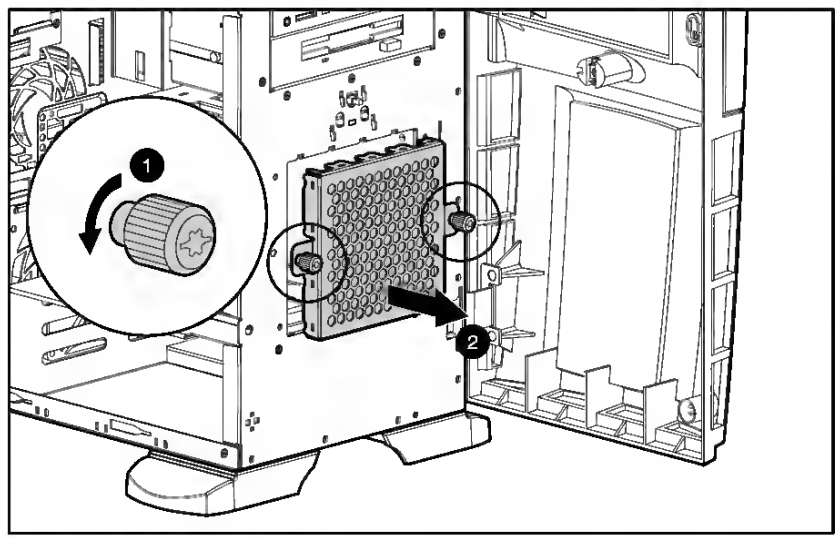


Figure 2-16. Removing the drive bay cover

7. With a Torx T-15 screwdriver, remove the four screws (1) securing the drive cage to the chassis.
8. Slide the drive cage (2) backward until it stops. Then pull the drive cage (3) away from the chassis.

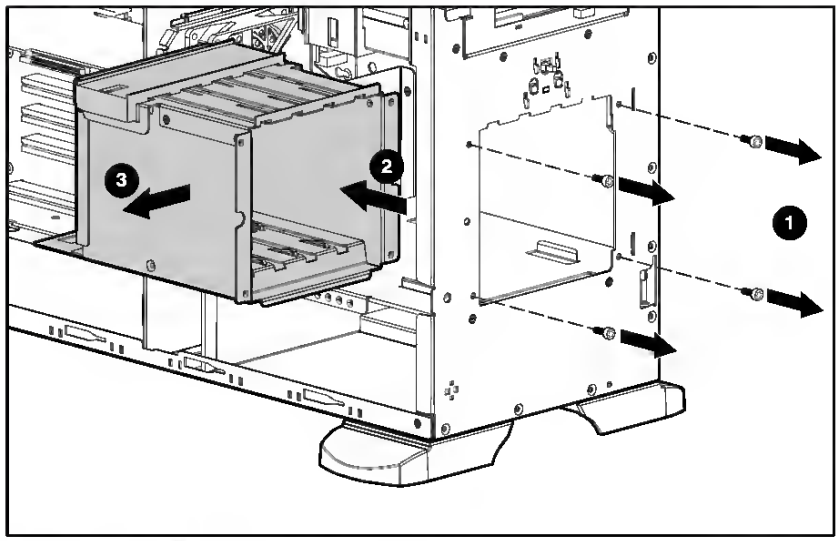


Figure 2-17. Removing a non-hot-plug hard drive cage

Reverse steps 1 through 8 to replace a non-hot-plug hard drive cage.

Hot-Plug Hard Drive or Drive Blank

The ProLiant ML350 server is optionally available with hot-plug hard drives.

To remove a hot-plug hard drive or drive blank:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Open the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Press down the release tab (1) on the side of the drive, then pull the drive or the drive blank (2) out of the drive bay.

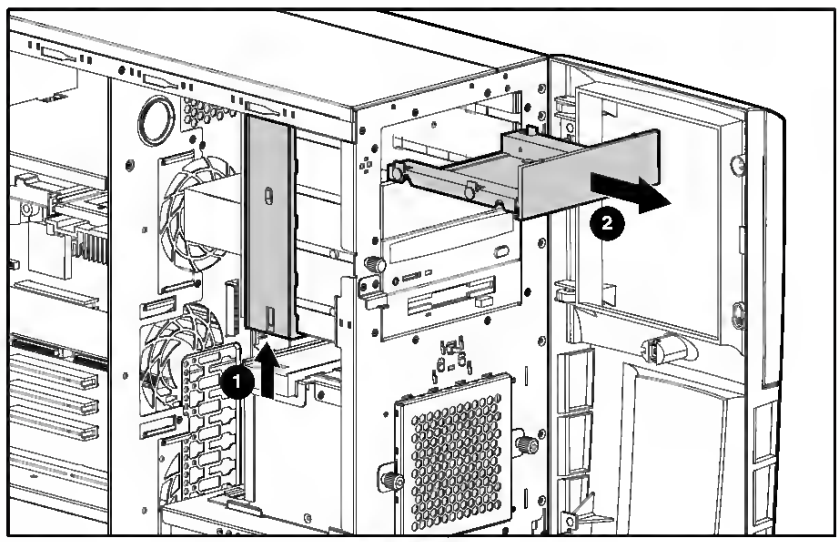


Figure 2-18. Removing a hot-plug hard drive or drive blank

Reverse steps 1 through 3 to replace a hot-plug hard drive or hard drive blank.

Hot-Plug Hard Drive Cage

To remove the hot-plug hard drive cage:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Ensure that all cables are disconnected from the hard drive cage.
5. Remove all hard drives and hard drive blanks. See "Hot-Plug Hard Drive or Drive Blank" earlier in this chapter.
6. With a Torx T-15 screwdriver, remove the three screws (1) securing the drive cage to the chassis.
7. Slide the drive cage (2) backward until it stops, then remove the drive cage (3) from the chassis.

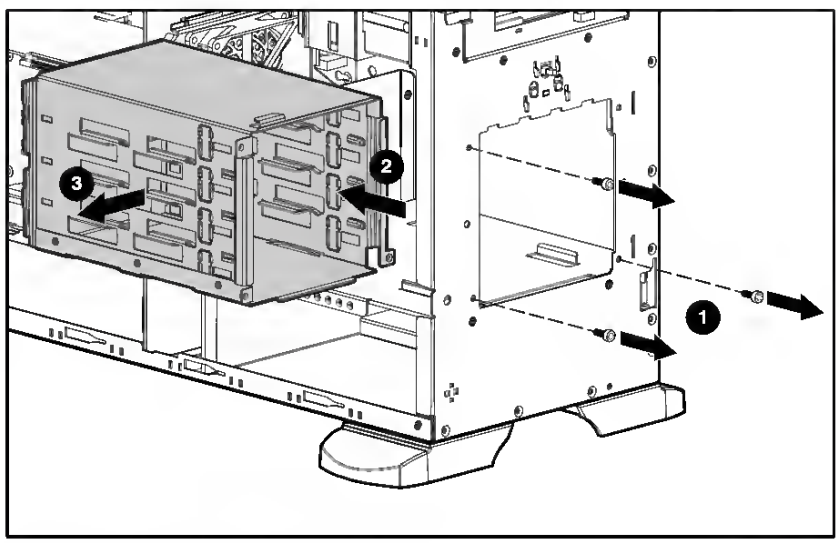


Figure 2-19. Removing a hot-plug hard drive cage

Reverse steps 1 through 7 to replace the hot-plug hard drive cage.

Removable Media Devices and Mass Storage Devices

The ProLiant ML350 server ships standard with four removable media and four mass storage device bays. The removable media bays contain a one-third height, 1.44-MB diskette drive, a one-half height IDE CD-ROM drive, and two open bays. The open bays may be used for a second CD-ROM drive, tape drives, hard drives, or any SCSI device. The four mass storage bays contain bard drives. Figure 2-20 and Table 2-3 sbow the standard drive configuration.

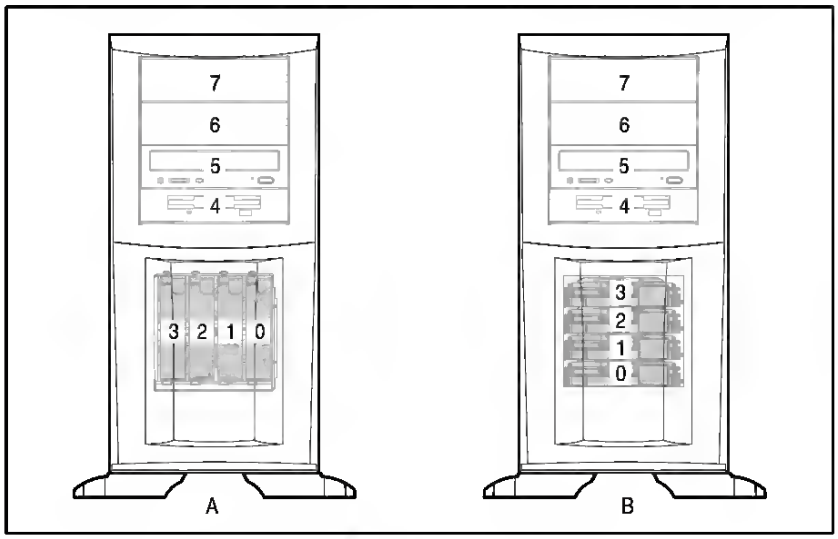


Figure 2-20. Location of removable media and mass storage device bays

Table 2-3
Removable Media and Mass Storage Device Bay Descriptions

Item	A: Non-Hot-Plug Configuration	B: Hot-Plug Configuration
0-3	Hard drive bays	Hard drive bays
4	1.44-MB diskette drive	1.44-MB diskette drive
5	IDE CD-ROM drive	IDE CD-ROM drive
6	Removable media bay	Removable media bay
7	Removable media bay	Removable media bay

To remove a removable media device:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Open the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Remove the access panel. See "Access Panel" earlier in this chapter.
4. Disconnect the power and the data cables (1) from the back of the removable media device.

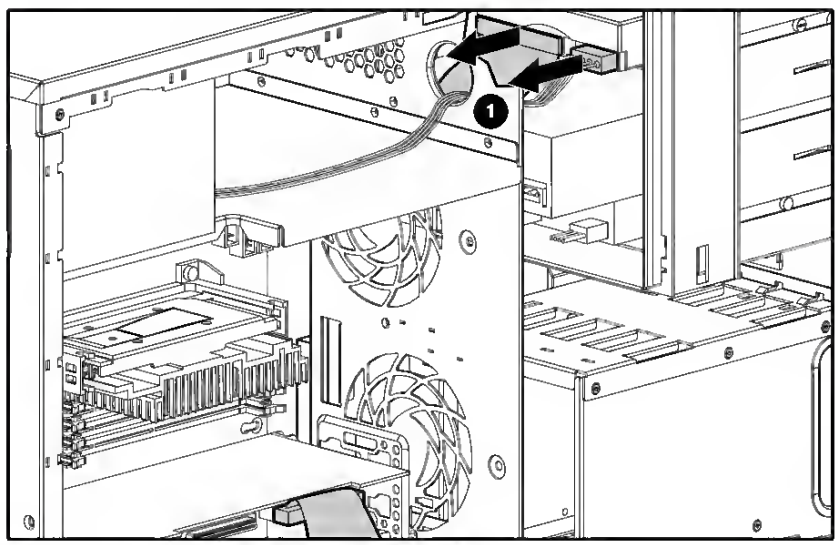


Figure 2-21. Disconnecting the removable media device cables

5. While pushing up the drivelock (1), pull the device (2) out of the drive bay.

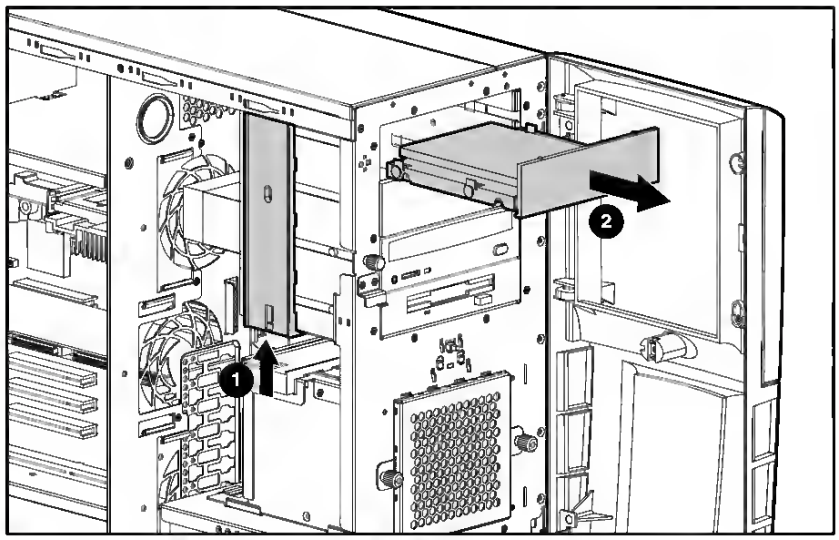


Figure 2-22. Removing the removable media device

Reverse steps 1 through 5 to replace a removable media device.

NOTE: It is not necessary to push up on the drivelock when replacing a removable media device. Push the drive until it clicks into place

Expansion Slots

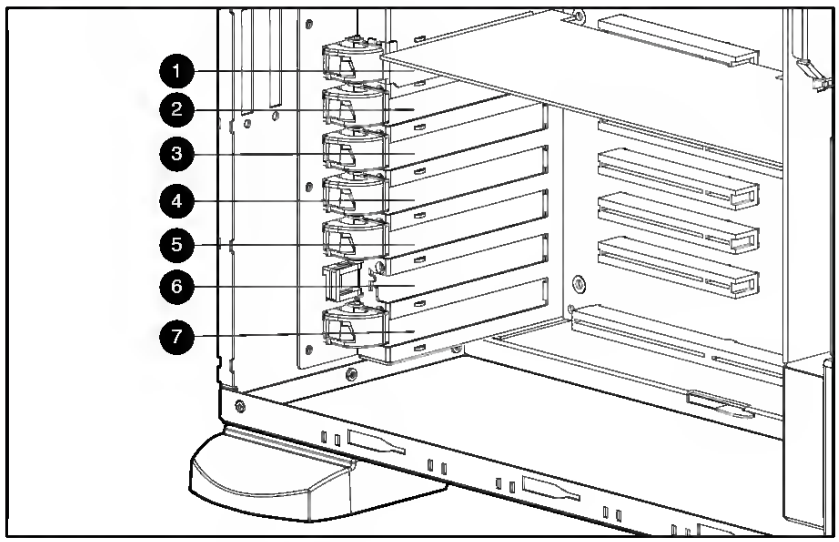


Figure 2-23. Locating the expansion slots

Table 2-4
Expansion Slots

Item	Slot
1	32-bit PCI (Server Feature Board)
2	64-bit PCI
3	64-bit PCI
4	32-bit PCI
5	32-bit PCI
6	32-bit PCI
7	ISA

Expansion Board (Server Feature Board)

To remove an expansion board (Server Feature Board):

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Disconnect any cables connected to the expansion board.
4. If an expansion board retainer is in place, loosen the thumbscrew (1) of the expansion board retainer, then pull the retainer (2) out and away from the chassis.

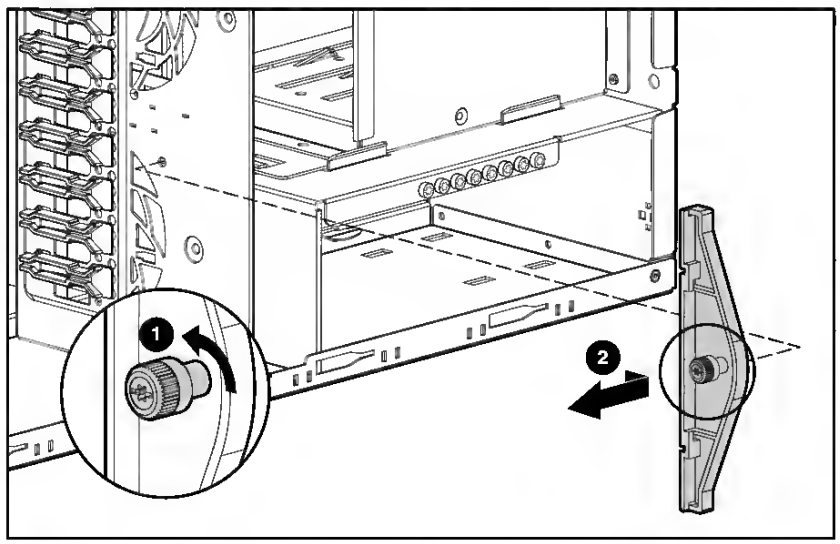


Figure 2-24. Removing the expansion board (Server Feature Board) retainer

5. Push in the expansion board slot release lever (1) to release it, then rotate the lever (2) outward.
6. Remove the expansion board (3).

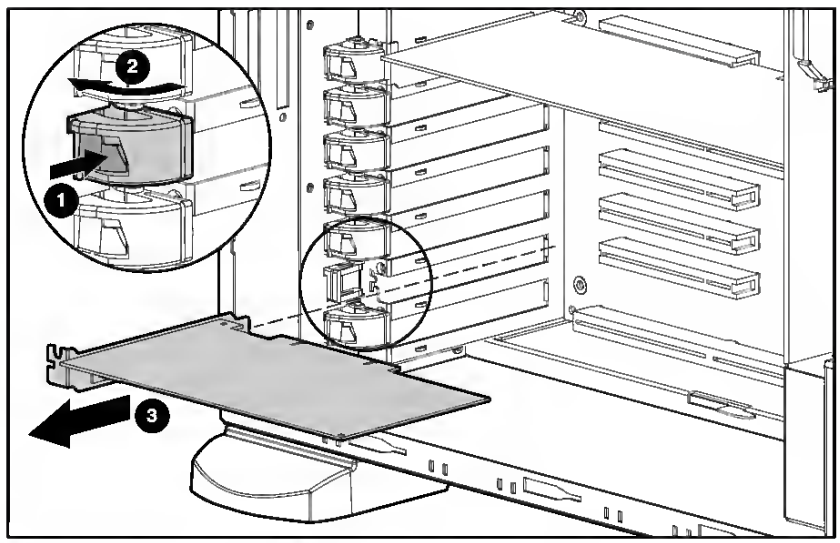


Figure 2-25. Removing the expansion board (server feature board)

Reverse steps 1 through 6 to replace an expansion board.

Memory

The ProLiant ML350 server supports PC 133-MHz ECC SDRAM Dual Inline Memory Modules (DIMMs). Additional DIMMs (64-, 128-, 256-, or 512-MB) are available to upgrade the system memory. The server bas four DIMM sockets located on the system board.

NOTE: DIMMs do not need to be installed in pairs.

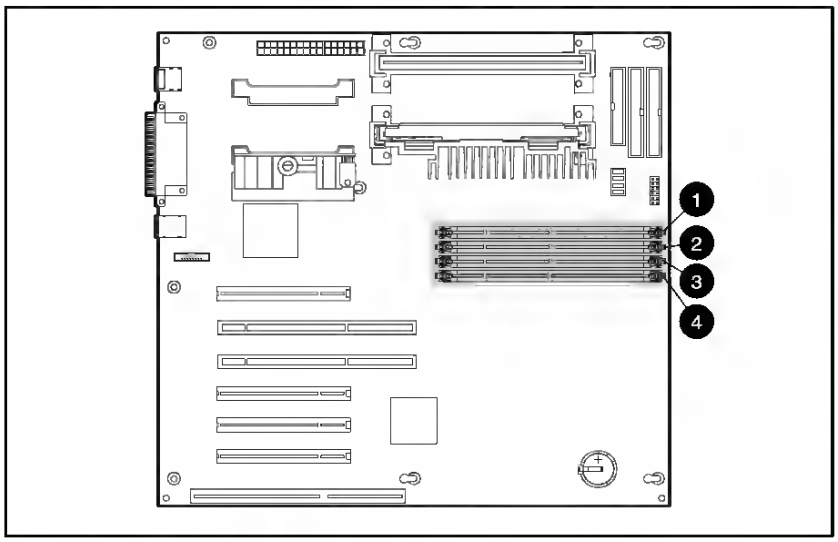


Figure 2-26. DIMM socket locations

Table 2-5
DIMM Socket Locations

Item	Description
1	DIMM socket 1
2	DIMM socket 2
3	DIMM socket 3
4	DIMM socket 4

Memory Module

To remove an SDRAM DIMM:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Press outward on both latches of the DIMM (1) at the same time. This action releases the module and pushes it partially out of the socket.
4. Lift the module (2) from the socket.

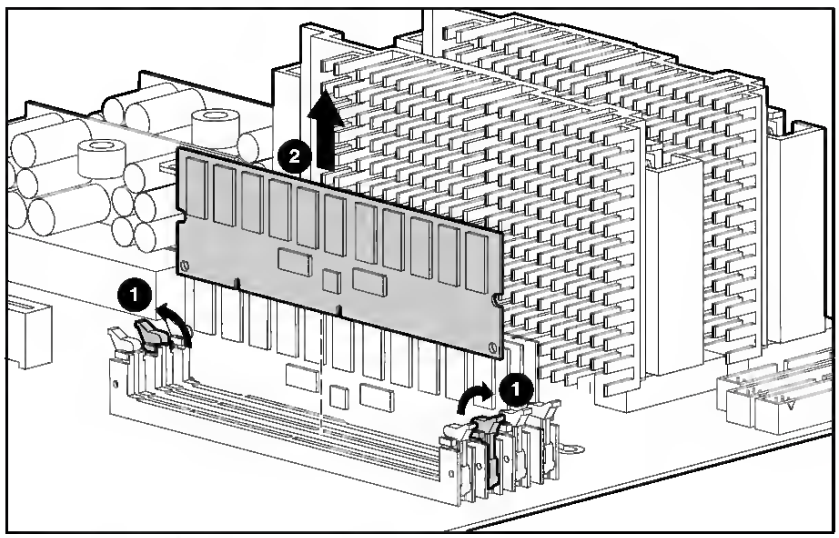


Figure 2-27. Removing a memory module

Reverse steps 1 through 4 to replace a memory module.

Memory Combinations

The following guidelines MUST be followed when installing or replacing memory:

- Use only 64-, 128-, 256-, or 512-MB ECC SDRAM DIMMs.
- SDRAM DIMMs must be PC 133-MHz ECC.
- Use Compaq SDRAM DIMMs only.

The recommended order of SDRAM DIMM installation is:

- First SDRAM DIMM in socket 4
- Second SDRAM DIMM in socket 3
- Third SDRAM DIMM in socket 2
- Fourth SDRAM DIMM in socket 1

Any combination of SDRAM DIMMs can be used.

Processor

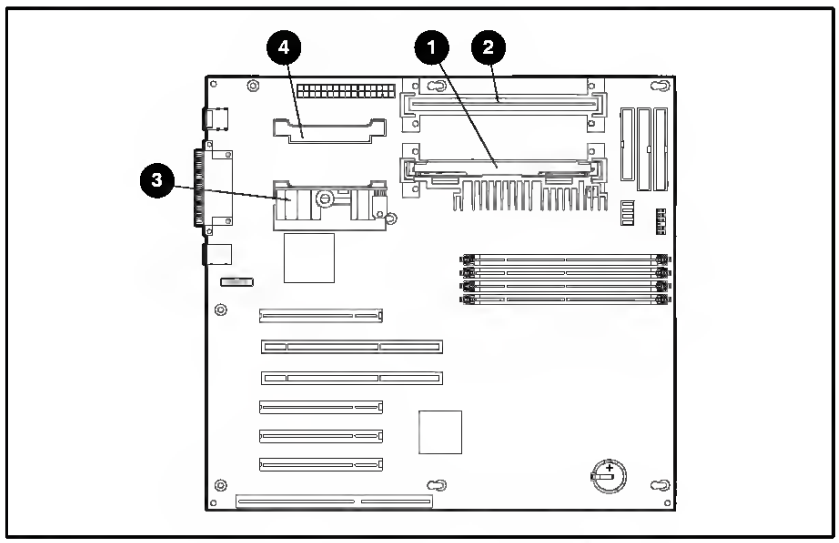


Figure 2-28. Processor and Processor Power Module (PPM) slot locations

Table 2-6
Processor and Processor Power Module (PPM) Slot Locations

Item	Description
1	Processor slot 1 (populated with processor)
2	Processor slot 2 (populated with processor terminator module)
3	PPM slot 1 (populated)
4	PPM slot 2

To remove a processor:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Push the release tabs (1) toward the center of the processor, and then gently lift the processor (2) from the system board.

NOTE: If removing the second processor, a terminator module must be installed for proper operation.

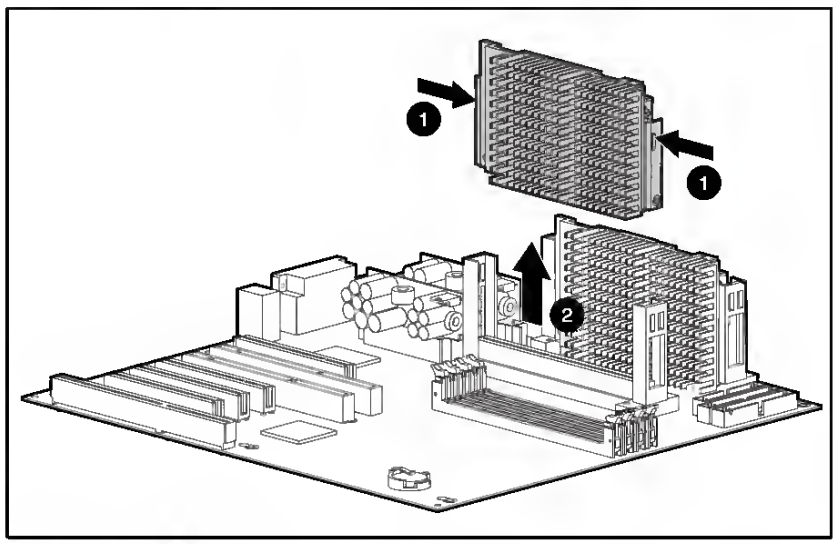


Figure 2-29. Removing a processor

Reverse steps 1 through 3 to replace a processor.

Processor Terminator Module

A processor terminator module must be installed in each empty processor slot. The processor terminator module is removed to install a second processor and PPM.

To remove the processor terminator module:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Press the release tabs (1) toward the center of the module, and then gently lift the processor module (2) to remove it.

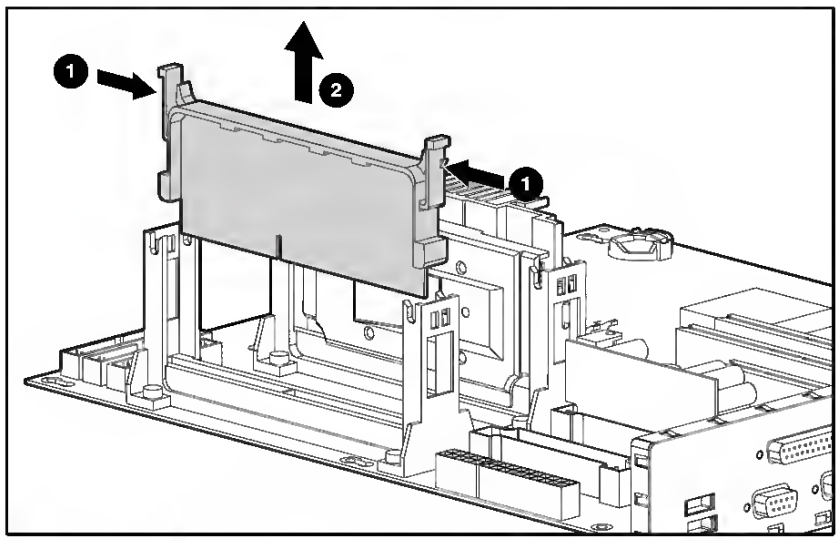


Figure 2-30. Removing the processor terminator module

Reverse steps 1 through 3 to replace a processor terminator module.

Processor Power Module (PPM)

Each Intel Pentium III processor supplied by Compaq comes with a Processor Power Module (PPM) (DC-to-DC converter). A PPM is removed when it needs to be replaced or when replacing the system board.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

To remove a PPM:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Push both release tabs (1) outward until the tabs release, and then gently lift up the PPM (2).

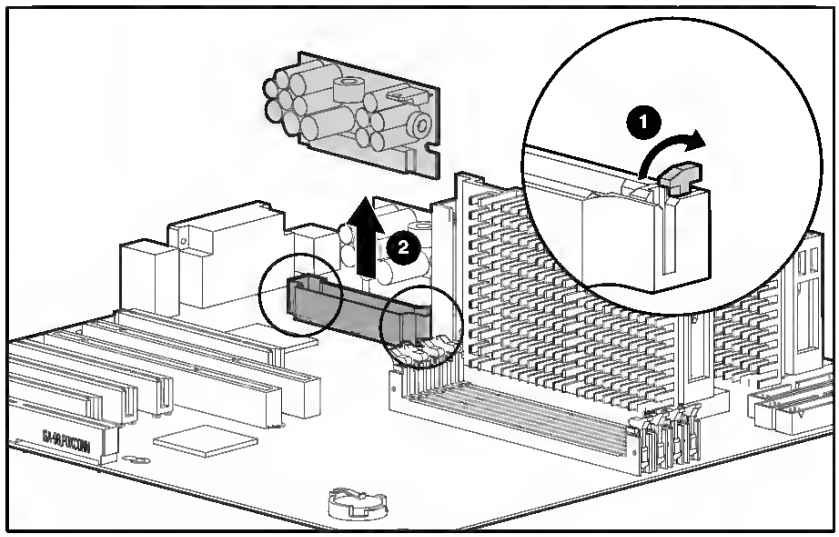


Figure 2-31. Removing a Processor Power Module (PPM) from the system board

Reverse steps 1 through 3 to replace a PPM.

System Board

To remove the system board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Disconnect all power cables, device cables, and the power switch cable from the system board.
4. Remove all expansion board(s), memory, processor(s), Processor Power Module(s), and terminator modules.
5. Remove the system fan module (1). See "System Fan Module" earlier in this chapter.

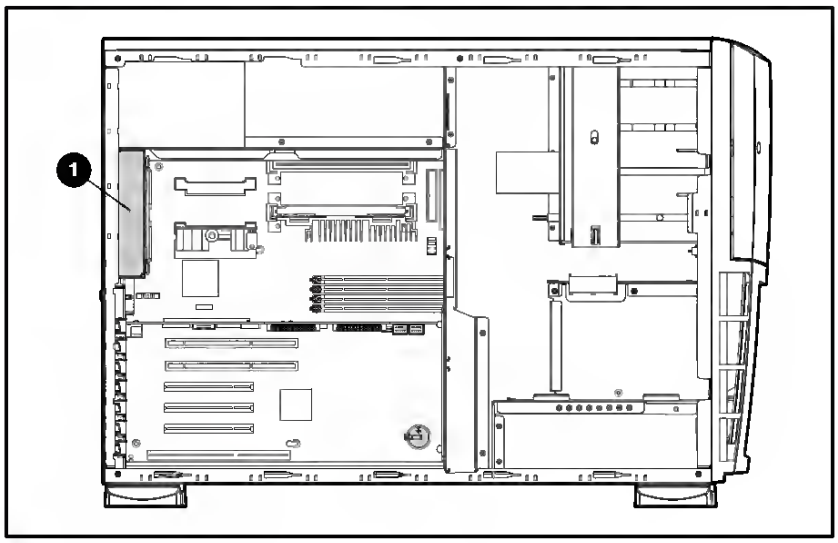


Figure 2-32. System fan module (1)

6. With a Torx T-15 screwdriver, remove the four screws (1) securing the system board to the chassis.
7. Push the system board (2) toward the front of the unit until it stops.
8. Lift up the rear part of the system board (3), and then pull it away from the chassis.

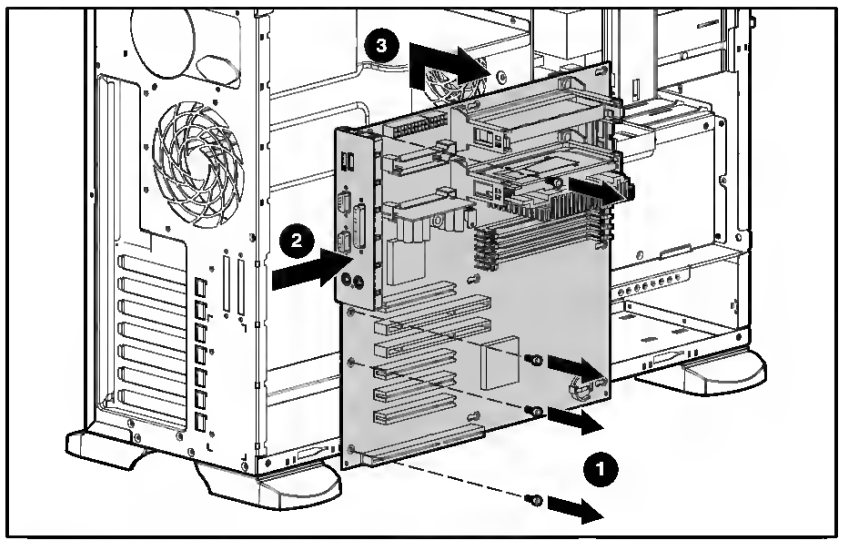


Figure 2-33. Removing the system board

Reverse steps 1 through 8 to replace the system board.

Batteries

The ProLiant ML350 server has a battery on the system board and a battery on the Server Feature Board. These batteries are required to maintain data.

The system board battery provides power to the real-time clock. When your server no longer automatically displays the correct date and time, you may need to replace the battery.

The Server Feature Board battery stores system management information. When the system management information no longer automatically saves, you may need to replace the Server Feature Board battery.

When replacing either battery, use a CR2032, 3-volt, lithium, coin cell battery.

WARNING: The system board and Server Feature Board each contain a lithium battery. There is a risk of fire and chemical burn if the battery is handled improperly. Do not disassemble, crush, puncture, or short external contacts, dispose of in water or fire, or expose the battery to temperatures higher than 60°C (140°F).

CAUTION: Static electricity can damage the electronic components of the server. Before beginning these procedures, be sure you are discharged of static electricity by briefly touching a grounded (earthed) metal object.

Replacing the System Board Battery

To remove and replace a lithium battery on the system board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Locate the battery (1) on the system board.
4. Gently pull on the battery release lever while sliding the battery (2) out of its bolder.

NOTE: If you have expansion boards installed, you may need to remove them in order to gain access to the battery.

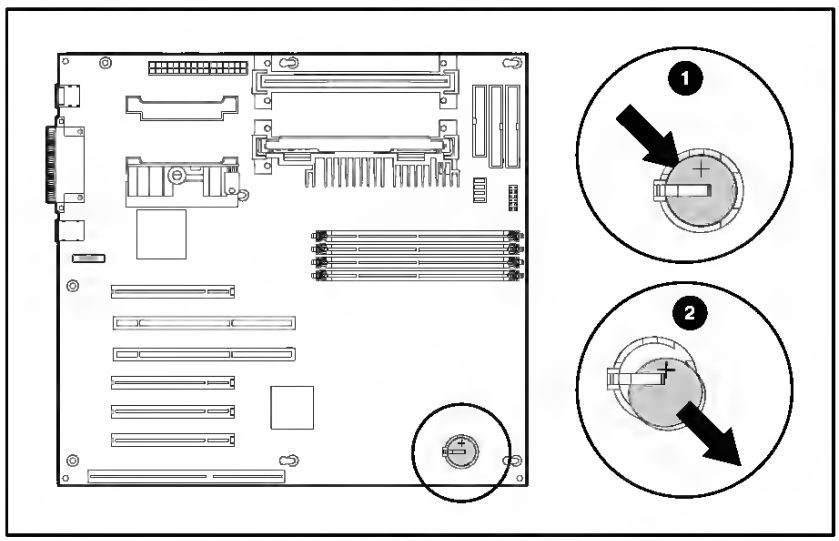


Figure 2-34. Locating and removing the battery from the system board

Replacing the Server Feature Board Battery

To remove and replace a lithium battery on the system board:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Locate the battery (1) on the system board.
4. Gently pull on the battery release lever while sliding the battery (2) out of its bolder.

NOTE: If you have expansion boards installed, you may need to remove them in order to gain access to the battery.

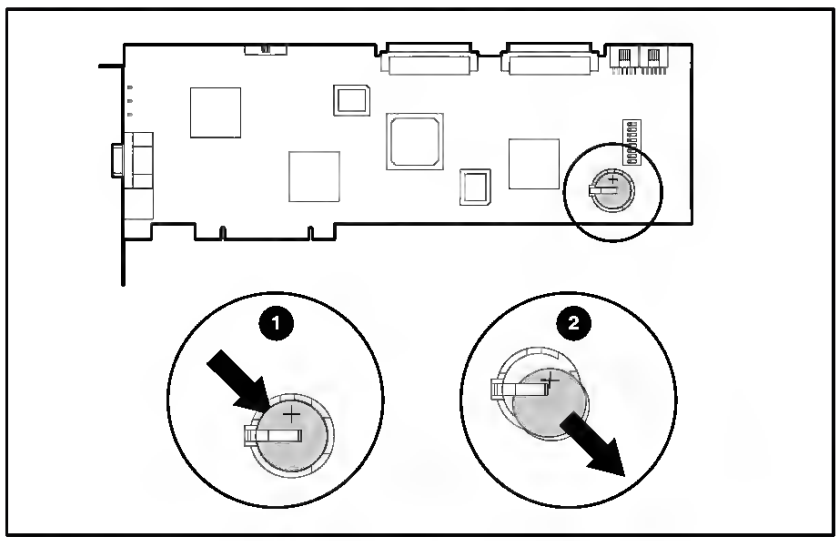


Figure 2-35. Locating and removing the battery from the Server Feature Board

Reverse steps 1 through 3 to replace the battery.

IMPORTANT: The battery should be installed with the positive polarity (+ side) positioned up.

Power Supply

To remove the power supply:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the access panel. See "Access Panel" earlier in this chapter.
3. Disconnect the internal power supply connectors from all system devices and the system board.
4. With a Torx T-15 screwdriver, remove the four screws (1) securing the power supply to the rear of the chassis.
5. Slide the power supply (2) forward until it stops, and then lift the power supply from the chassis.

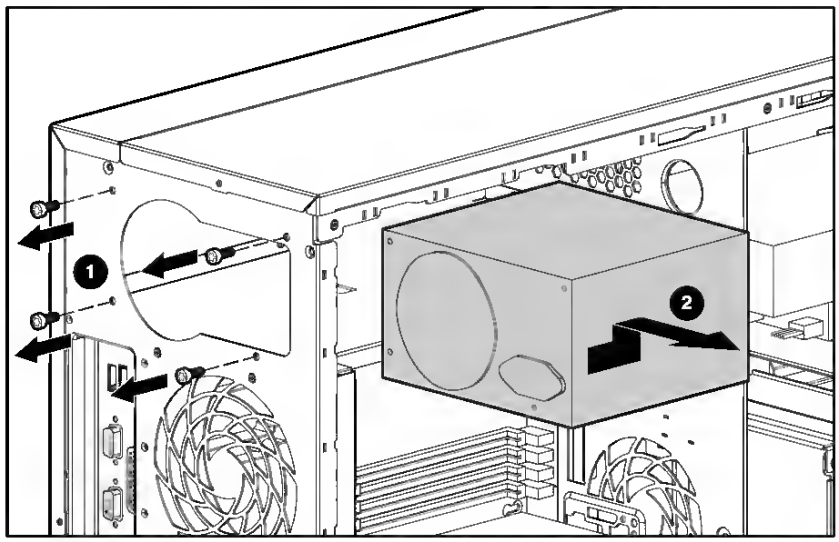


Figure 2-36. Removing the power supply

Reverse steps 1 through 5 to replace the power supply.

Feet

To remove the feet from the chassis, one at a time:

1. Complete the preparation procedures. See "Preparation Procedures" earlier in this chapter.
2. Remove the front bezel door. See "Front Bezel Door" earlier in this chapter.
3. Place the server upside down.
4. Remove the Torx T-15 screw (1) securing each foot to the chassis.
5. Pivot each foot (2), then pull it off the base (3) of the chassis.

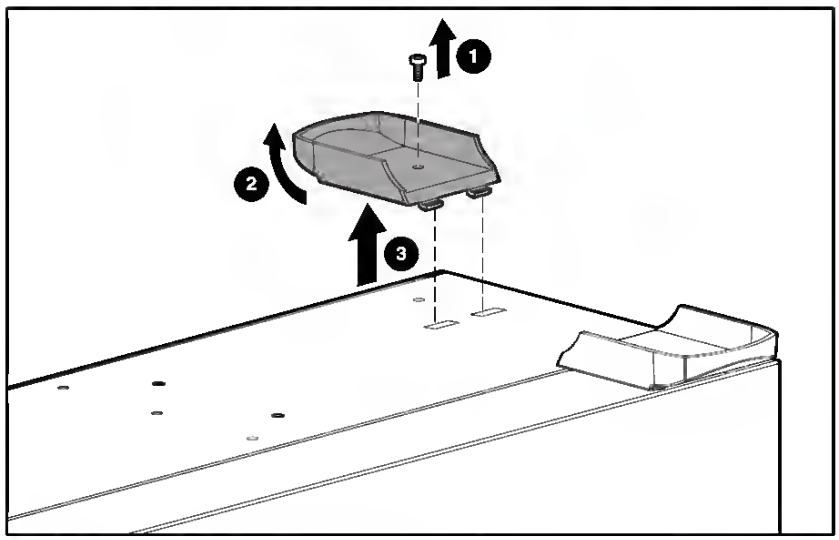


Figure 2-37. Removing the feet from the chassis

Reverse steps 1 through 5 to replace the feet.

Chapter 3

Diagnostics and Troubleshooting

This chapter describes software and firmware diagnostic tools available for Compaq server products utilizing the Server Feature Board. The sections in this chapter are:

- Diagnostic Tools Utility Overview
- Default Configuration
- Inspect Utility
- Utilities Access
- Power-On Self-Test (POST) Error Messages
- Diagnostics Software
- Array Diagnostic Utility (ADU)
- Integrated Management Log (IML)
- Rapid Error Recovery
- ROMPaq Error Recovery Options
- Compaq Insight Manager

Diagnostic Tools Utility Overview

These tools were developed to assist in diagnosing problems, testing the hardware, and monitoring and managing Compaq server hardware.

Table 3-1
Diagnostic Tools

Tool	What it is	How to run it
Compaq Diagnostics Program	Utility to assist testing and verifying operation of Compaq hardware. If problems are found, Diagnostics isolates failure(s) down to replaceable part, whenever possible.	Diagnostics software is available on the Compaq SmartStart and Support Software CD. Create a Diagnostics diskette from SmartStart and Support Software CD, and run Diagnostics from diskette.
Compaq Insight Manager	A client/server application used to remotely manage Compaq hardware in a network environment. Reports hardware fault conditions (both failure and pre-failure) and collects data for reporting and graphing.	For more information, refer to the Compaq Management CD and the *Compaq Insight Manager User Guide*. More information on viewing and printing the event list can be found in the "Compaq Insight Manager" section of this chapter.
Compaq Survey Utility	An online information gathering agent that runs on servers, gathering critical hardware and software information from various sources. A utility for servers running Microsoft Windows NT or Novell NetWare. If a significant change occurs between data gathering intervals, previous information is marked, and the survey text file is overwritten to reflect the latest configuration and changes since last configuration. This action allows a historical record of change events for server hardware and software.	Install Survey from SmartStart, the Compaq Integration Maintenance Utility, or the Compaq Management CD.

continued

Table 3-1
Diagnostic Tools *continued*

Tool	What it is	How to run it
Array Diagnostics Utility (ADU)	A Windows-based tool designed to run on all Compaq systems that support Compaq array controllers. Two main functions of ADU are to collect all possible information about the array controllers in the system and to generate a list of detected problems.	Use the information provided in "Array Diagnostics Utility (ADU)" later in this chapter.
Integrated Management Log (IML)	A log of system events, such as system failures or nonfatal error conditions. View events in the IML from within: ■ Compaq Insight Manager ■ Compaq Survey Utility ■ Compaq IML Viewers	The IML requires Compaq operating system-dependent drivers. Refer to the Support Software CD for instructions on installing the appropriate drivers.
Compaq Inspect Utility	The Inspect utility provides a report detailing system information.	The Inspect utility can be run from either the main menu of the System Configuration Utility or the Compaq Diagnostics Program.
BIOS Setup Utility	Utility to easily configure the hardware installed in or connected to the server. Specifically, it can: ■ Configure PCI boards automatically ■ Manage installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives ■ Store configuration information in nonvolatile memory ■ Assist in installation of an operating system	The BIOS Setup Utility is loaded during POST if the **F10** key is pressed. When "F10-Setup" displays in the lower right corner of the screen, press the **F10** key to initiate the utility.

Default Configuration

When the system is first powered up, the system ROM detects the unconfigured state of the hardware and provides default configuration settings for most devices. By providing this initialization, the system can run Diagnostics and other software applications before running the normal SmartStart and OS Installation programs.

Select the primary operating system in the BIOS Setup Utility before running or installing an OS.

Inspect Utility

The Inspect Utility provides configuration information such as the contents of the operating system startup files, the current memory configuration, the ROM version, and Integrated Management Log information. It operates with MS-DOS emulation mode of OS/2.

Running the Inspect Utility

1. Power the server down, then back up, then press **F10** when the cursor appears in the upper right corner of the screen.
2. At the main menu, select Diagnostics and Utilities.
3. Press **Enter**.
4. Select Inspect Computer and press **Enter**.

   NOTE: If Diagnostics is not installed on the hard drive, System Configuration prompts you to insert the Diagnostics diskette in drive A.

5. Follow the instructions.

Printing the Inspect Listing

Select Print on the Inspect screen to print a copy of the Inspect listing. Keep a copy of the listing with each server for later reference.

Utilities Access

The SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain the system, including:

- Array Configuration Utility (ACU)
- Erase Utility
- Array Diagnostic Utility (ADU)
- ROMPaq Firmware Upgrade Utilities
- Compaq Diagnostics

CAUTION: To avoid data loss to the entire system, do not select the Erase Utility when running the SmartStart and Support Software CD.

Running Compaq Utilities

Compaq Utilities may be run from diskette or from the SmartStart and Support Software CD.

Running the Utilities from Diskette

- Run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.
- Create a diskette version of the utility from the SmartStart and Support Software CD.

To create diskette versions of the utilities from the CD:

1. Start the SmartStart and Support Software CD.
2. From the System Utilities screen, select Create Support Software Disks, and then select Next.
3. Select the diskette you would like to create from the list, and then follow the instructions on the screen.

Running the Utilities from the SmartStart and Support Software CD

IMPORTANT: Only the Array Configuration Utility (ACU) and the Array Diagnostic Utility (ADU) can be executed from the SmartStart and Support Software CD. All other utilities must be executed from diskette.

To run these utilities directly from the SmartStart and Support Software CD:

1. Start the SmartStart and Support Software CD.
2. From the System Utilities screen, select the utility you wish to run, and then select Next.

Power-On Self-Test (POST) Error Messages

The Power-On Self-Test (POST) is a series of diagnostic tests that runs automatically on Compaq computers when the system is powered up. POST checks firmware and assemblies to ensure that the computer system is functioning properly.

If POST finds an error in the system, an error condition is indicated by an audible or visual message. If an error code displays on the screen during POST or after resetting the system, follow the instructions in the Table 3-2. The error messages and codes listed include all codes generated by Compaq products. Your system generates only the codes that are applicable to your configuration and options.

NOTE: Many of the actions listed require you to run Diagnostics or the server setup utility appropriate to your server. Steps for running these utilities are also provided in the *Compaq Servers Troubleshooting Guide*.

Table 3-2
POST Error Messages

Error Code	Audible Beeps	Probable Source of Problem	Action
A Correctable Memory Error occurred prior to this power up	None	A memory module has experienced an error that, while recoverable, has generated a predictive failure warning.	Run Diagnostics to identify the failed memory module, and then replace it.
A Critical Error occurred prior to this power up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
Beeps only	2 long	No valid memory is present in the system.	1. If no memory modules are present, install at least one memory module to conform to minimum hardware configuration specifications. 2. Reseat all installed memory modules. 3. If the system contains more than one memory module, remove one module, and restart the server, repeating as needed to isolate the bad memory module.
Beeps only	2 long, 2 short	The power has cycled because the temperature is too hot. The processor fan is not installed, or is not spinning.	Check fans.
Critical Fan Failure Detected – System Shutting Down System Halted	None	A critical fan is not spinning.	1. Check fans. 2. Check fan cable connections.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
ECC Multiple Bit Error Oetected in OIMM:	None	A memory module failure generated a multiple bit error that could not be corrected.	Run Oiagnostics and replace failed memory module as indicated.
FATAL ROM ERROR: The System ROM is not properly programmed.	1 long, 1 short	The System ROM is not properly programmed.	Flash the ROM or replace the physical ROM part.
Initialization failure. Re-seat the processor and Processor Power Module before attempting replacement	None	Processor was not fully seated. A processor internal failure occurred.	1. Reseat the processor. 2. Replace the processor if the failure recurs.
Invalid electronic serial number	None	Serial number in BIOS is incorrect.	Run server setup utility to program serial number.
No SCSI Oevices Oetected	None	No SCSI devices are connected to the boot controller	Verify configuration. Check SCSI cable, attached drives, and SCSI IOs
Non-System disk or disk error	None	No bootable disk partition was found on the boot drive.	1. Remove diskette from diskette drive. 2. Check controller order in server setup utility. 3. Check boot order in server setup utility. 4. Reinstall operating system.
Parity Check 2	None	A PCI device generated a parity error 2	Remove recently added PCI adapters. Add the adapters again one at a time to determine which is generating errors. Replace the failed device.
(RESUME – F1 key)	None	As indicated to continue.	Press **F1.**

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
(Run System Configuration Utility – F10 key)	None	A configuration error occurred during POST.	Press **F10** to run server setup utility.
Unsupported Processor Detected System Halted	1 long, 1 short	Processor not supported by current system ROM.	Check documentation for supported processors. If supported, remove the processor and update system to latest ROM, then reinstall processor.
101-ROM Error	1 long, 1 short	System ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
101-I/O ROM Error	None	Options ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
102-System Board Failure	None	8237 DMA controllers, 8254 timers, and so on.	Replace the system board. Run the Compaq server setup utility.
104-ASR-2 Timer Failure	None	System board failure.	Run Diagnostics. Replace failed assembly as indicated.
105-Current System ROM is corrupt – now booting redundant System ROM	2 long	Nonbooted ROM image is corrupted.	Flash the ROM utilizing ROMPaq. Refer to the ROMPaq Disaster Recovery section of this guide.
162-System Options Not Set	2 short	Configuration incorrect.	Run the server setup utility and correct.
163-Time & Date Not Set	2 short	Invalid time or date in configuration memory.	Run the server setup utility and correct.
164-Memory Size Error	2 short	Configuration memory incorrect.	Run the server setup utility and correct.
172-Configuration Non-volatile Memory Invalid	None	Nonvolatile configuration corrupted.	Run the server setup utility and correct.
173-Slot ID Mismatch	None	Board replaced, configuration not updated.	Run the server setup utility and correct.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
174-Configuration/Slot Mismatch Device Not Found	None	EISA or PCI board not found.	Run the server setup utility and correct.
175-Configuration/Slot Mismatch Device Found	None	EISA or PCI board added, configuration not updated.	Run the server setup utility and correct.
177-Configuration Not Complete	None	Incomplete System Configuration detected.	Run the server setup utility and correct.
178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the server setup utility and correct.
180-Log Reinitialized	None	The IML has been reinitialized, probably due to corruption of the log.	Event message, no action required.
201-Memory Error	None	RAM failure detected.	Run Diagnostics. Replace failed assembly as indicated.
202-Memory Type Mismatch	2 short	An incompatible memory module is installed in the system.	Compare Compaq part numbers from installed memory modules with the manual. If not listed, the memory modules are incompatible and should be replaced or removed
203-Memory Address Error	None	RAM failure detected.	Run Diagnostics. Replace failed assembly as indicated.
207-ECC Corrected Single Bit Errors in DIMM in Memory Module Socket	2 short	A memory module is malfunctioning.	Run Diagnostics. Replace or remove malfunctioning memory module as indicated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
207-Invalid Memory Configuration – Check DIMM Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed – Check DIMM Installation	1 long, 1 short	Speed of the memory is not compatible.	Verify the speed of the memory modules installed, then check the server user documentation and replace as indicated.
209-Memory Detection Failure. Check Memory Installation	1 long, 1 short	Unable to size memory.	Check memory module installation and if error persists, call Compaq authorized service provider.
211-Invalid Voltage Regulator Module installed for Processor *X*	None	Nonredundant PPM installed in indicated processor slot.	Replace with a PPM that supports redundancy.
212-System Processor Failed/Mapped out	1 short	Processor in slot *X* failed.	Run Diagnostics and replace failed processor.
214-DC-DC Converter Failed	None	PPM failed.	Run Diagnostics. Replace failed assembly as indicated.
214-Memory Device Failure Error Code:*X* Memory Module DIMM:*Y*	2 short	A memory module has failed.	Run Diagnostics. Replace failed memory module as indicated.
214-Processor PPM Failed, Module *X*	None	Indicated PPM failed.	Replace failed assembly as indicated.
215-Processor Power Module has lost Redundancy in Socket *X*	None	PPM (DC-DC converter) has lost redundancy.	Run Diagnostics. Replace failed assembly as indicated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
215-Nonfunctioning Voltage Regulator Module for Processors	None	PPM (DC-DC converter) failed or lost redundancy.	Run Diagnostics. Replace failed assembly as indicated.
216-Voltage Regulator Module for Processor *X* no longer redundant	None	Redundancy failed in PPM.	To restore redundancy, replace the PPM.
216-Processor PPM has lost Redundancy, Module *X*	None	Indicated PPM has lost redundancy.	Replace failed assembly as indicated.
218-Cache Accelerators Not Installed. System Halted	None	Cache Accelerators not installed or improperly installed.	Check Cache Accelerator installation.
219-Tag Update Rules SRAM Failure. System Halted	None	Catastrophic chipset failure occurred.	Call Compaq authorized service provider.
219-Snoop Rules SRAM Failure System Halted	None	Catastrophic chipset failure occurred.	Call Compaq authorized service provider.
220-cache accelerator Slot *X* Initialization Failed System Halted	None	Cache Accelerator in slot *X* improperly installed or bad.	Check Cache Accelerator installation and if properly installed, replace
221-Power Fault On Processor Bus *X*	None	A PPM on indicated bus is in a failed state.	Run Diagnostics. Replace failed assembly as indicated.
301-Keyboard Error	None	Keyboard failure occurred.	Power down the computer, then reconnect the keyboard.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure occurred.	Replace the keyboard.
ZZ-301-Keyboard Error	None	Keyboard failure occurred. (*ZZ* represents the Keyboard Scan Code.)	1. A key is stuck. Try to free it 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure occurred.	1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure.	1. Make sure the keyboard is attached. 2. Run Diagnostics. 3. Replace the indicated part.
40*X*-Parallel Port *X* Address Assignment Conflict	2 short	Both external and internal ports are assigned to Parallel Port *X*.	Run the server setup utility and correct.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
404-Parallel Port Address Conflict Detected A hardware conflict in your system is keeping some system components from working correctly. If you have recently added new hardware remove it to see if it is the cause of the conflict. Alternatively, use Computer Setup or your operating system to ensure that no conflicts exist.	2 short	Hardware conflict in your system is preventing the parallel port from working correctly.	1. If you have recently added new hardware, remove it to see if the hardware is the cause of the conflict. 2. Run your server configuration utility to reassign resources for the parallel port and manually resolve the resource conflict. 3. Run Diagnostics to resolve the issue.
601-Diskette Controller Error	None	Diskette controller circuitry failure occurred.	1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace failed assembly as indicated.
602-Diskette Boot Record Error	None	Boot sector on the boot disk is corrupt.	1. Remove diskette from the diskette drive. 2. Replace diskette in drive. 3. Reformat diskette.
605-Diskette Drive Type Error	2 short	Mismatch in drive type occurred.	Run the server setup utility to set diskette drive type correctly.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
611-Primary Floppy Port Address Assignment Conflict	2 short	Hardware conflict in your system is preventing the diskette drive from operating properly.	1. Run your server setup utility to configure the diskette drive port address and manually resolve the conflict. 2. Run Diagnostics and replace failed assembly as indicated.
800-Server Feature Board must be installed in slot 1 for proper operation	None	System has detected the absence of the Server Feature Board. Server Feature Board is not installed in the proper slot. Server Feature Board does not match this system.	1. Install the Server Feature Board in PCI slot 1. 2. Reseat the Server Feature Board. 3. Verify that the Server Feature Board is from this system.
801-Server Feature Board is not properly cabled to the system. Verify that the server management information cable from the system board to the Server Feature Board in slot 1 is intact and fully seated at both ends	None	System has detected that the server management information cable is not properly installed.	1. Make sure a server management information cable is installed in the system. 2. Inspect the server management information cable for signs of damage. 3. Reseat the server management information cable on the system board and on the Server Feature Board.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
802-Processor *X* is missing or terminator board is not present. System Halted.	None	System detected that the indicated processor slot is empty.	1. Verify that a processor or processor terminator board is installed in each processor slot. 2. Reseat the processor or processor terminator board in each processor slot. 3. Verify that each processor has a corresponding PPM installed. 4. Try replacing each processor with a processor terminator board to detect a failed processor or PPM.
803-Processor speeds must match for system operation. System Halted	None	Two processors with different speed ratings are installed in the system. All installed processors must have the same speed rating for safe operation.	1. Replace one of the processors with a processor terminator card. 2. Replace one of the processors with an alternate processor rated for the same operating speed as the installed processor.
804-100MHz memory is incompatible. System Halted	None	A memory module other than 133-MHz ECC SDRAM DIMM has been detected.	1. Reseat all memory modules in the system. 2. Remove incompatible memory modules. 3. Sequentially try each memory module in DIMM slot 1 to identify the incompatible memory module.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
805-The bootstrap processor is not the lowest stepping processor in the system. This is unsupported configuration. Swap the position of the processors on the system board to correct this issue.	None	System has detected that the processors in the system are not the same stepping and that the processor in processor slot 1 has a lower stepping than the processor in processor slot 2. The processor in processor slot 2 must have the same or lower stepping than the processor in processor slot 1. (Processor stepping is a designation that reflects the processor generation.)	1. Remove the processor from processor slot 1. 2. Remove the processor from processor slot 2. 3. Install the processor from processor slot 1 into processor slot 2. 4. Install the remaining processor in the available processor slot.
806-NVRAM has been reset Please power off the system and restore SW1 2 to the default position. Run BIOS Setup to set default values. System Halted.	None	System configuration switch (SW1), position 2 has been turned On and the system configuration data has been cleared from CMOS. This switch must be returned to the default Off position for normal operation and the ability to save configuration setup data. The system must be reconfigured.	1. Remove power from the system. 2. Locate the system configuration switch (SW1). See Chapter 4 for instructions. 3. Return SW1.2 to the Off position. 4. Restart the system. 5. Press **F10** to run the server setup utility and configure the system. 6. Select the primary operating system. 7. Set the date and time. 8. Complete additional configuration as needed.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
807-The Setup password is cleared. Please power off and restore the clear password switch (SW1.1)	None	System board configuration switch SW1.1 has been turned on and the system configuration password has been cleared. SW1.1 must be returned to the default Off position for normal operation and the ability to set a password with the server setup utility.	1. Remove power from the system. 2. Locate the system board configuration switch. 3. Return SW1.1 to the Off position. 4. Restart the system. 5. Press **F10** and use the server setup utility to set a new password.
1151-Com Port 1 Address Assignment Conflict	2 short	Both external and internal serial ports are assigned to COM1.	Run the server setup utility and correct.
1151-Serial Port A Address Conflict Detected	2 short	Hardware conflict is preventing the normal operation of a serial port.	Run the server setup utility to reassign the serial port address and manually resolve the conflict.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2 short	Both external and internal serial ports are assigned to COM2, COM3, or COM4.	Run the server setup utility and correct
1152-Serial Port B Address Conflict Detected	2 short	Hardware conflict is preventing the normal operation of a serial port.	Run the server setup utility to reassign the serial port address and manually resolve the conflict.
1155-Serial Port Address Conflict Detected	2 short	Hardware conflict is preventing the normal operation of a serial port.	Run the server setup utility to reassign the serial port address and manually resolve the conflict.
1610-Temperature violation detected. Waiting for system to cool	2 short	Ambient system temperature too hot.	Check fan and system environment.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1611-CPU Fan failure detected	None	Required fan not spinning.	1. Check fans. 2. Reseat fan cable. 3. Replace fan.
1611-CPU Fan not present	None	Required fan not installed.	1. Check fans. 2. Reseat fan cable. 3. Install missing fan.
1611-CPU Fan (Fan *X*) failure detected.	2 short	CPU fan has failed.	Replace the failed CPU fan.
1611-Fan failure detected.	2 short	Required fan not installed or spinning.	Check fans.
1611-I/O Fan failure detected	None	Required fan not spinning.	1. Check fans. 2. Reseat fan cable. 3. Replace fan.
1611-I/O Fan not present	None	Required fan not installed.	1. Check fans. 2. Reseat fan cable. 3. Install missing fan.
1611-I/O Fan (Fan *X*) failure detected.	2 short	I/O fan has failed.	Replace the failed I/O fan.
1611-System Fan failure detected	None	Required fan not spinning.	1. Check fans. 2. Reseat fan cable. 3. Replace fan.
1611-System Fan not present	None	Required fan not installed.	1. Check fans. 2. Reseat fan cable. 3. Install missing fan.
1612-Primary power supply failure.	2 short	Primary power supply has failed.	Replace power supply as soon as possible.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1613-Low System Battery.	None	Real-time clock system battery is running low on power.	Replace battery (or add external battery) as soon as possible.
1615-Power supply configuration error	None	Your configuration requires an additional power supply. A moving bar indicates that the system is waiting for another power supply to be installed.	Install the additional power supply.
1615-Power Supply Failure, Power Supply Unplugged, or Power Supply Fan Failure in Bay *X*.	None	Power supply has failed.	Reseat power supply firmly. -Or- Replace power supply as soon as possible.
1617-Fan controller not responding. System halted.	2 short	Fan controller failure detected.	Check and replace failed controller assembly.
1617-I/O Fan controller not responding. System halted.	2 short	I/O fan controller failure detected.	Check and replace failed controller assembly.
1617-CPU Fan controller not responding. System halted.	2 short	CPU fan controller failure detected.	Check and replace failed controller assembly.
1618-PCI slots powered down. Check PCI Hot-Plug enabler connectors.	None	PCI Hot Plug enabler is missing or failed.	Check and replace missing or failed assembly.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1620-Locked SCSI Bus Detected. Verify SCSI bus cabling. System halted.	None	SCSI bus failure detected.	Ensure that the integrated SCSI controller has SCSI termination attached.
1621-Current SCSI bus cable configuration is not recommended	None	Improper SCSI bus cabling detected.	Check documentation for proper SCSI bus cabling.
1622-Internal SCSI Jumper Board Not Installed.	None	System has detected that the array enabler board is not installed.	Install the array enabler board.
1701-SCSI Controller Failure	None	Embedded SCSI controller has failed or an attached device is preventing normal operation.	1. Check SCSI cables and verify they are fully seated. 2. Verify SCSI IDs are assigned correctly at each SCSI device. 3. Remove SCSI cables from the controller and observe if the failure still occurs. If necessary, replace the cables. 4. Run Diagnostics. 5. Remove individual SCSI devices from the cable to identify a suspect device. 6. Replace failed assembly.
1702-SCSI Cable Error Detected	None	SCSI cable has failed.	1. Reseat the SCSI cable on the controller and all attached devices. 2. Check the SCSI cable at all connectors for bent pins. 3. Replace SCSI cable.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1720-Slot *X* Drive Array – S.M.A.R.T. Hard Drive(s) Detect Imminent Failure SCSI: Port *Y*: SCSI ID *Z*.	None	Hard drive predictive failure condition detected.	The indicated drive has reported a SMART predictive failure condition. It may fail at some time in the future. If this drive is part of a non-fault-tolerant configuration, back up all data before replacing the drive and restore all data afterward. If this drive is part of a fault-tolerant configuration, do not replace this drive unless all other drives in the array are online. Press **F1** to resume
1721-Slot *X* Drive Array – Drive parameter tracking predicts imminent failure. The following devices should be replaced when conditions permit. Do not replace drive unless all other drives in the array are on-line! Back up data before replacing drive(s) if using RAID 0.	None	Monitor and Performance threshold exceeded condition.	Replace the drive when it is reasonable for you to do so. The drive has not failed, but Compaq recommends you replace the drive.
1721- SMART SCSI Hard Drive detects imminent failure	None	Indicated drive has reported a SMART predictive-failure condition and may fail at some time in the future.	If this drive is part of a non-fault-tolerant configuration, back up all data before replacing the drive, and restore all data afterward. -Or- If this drive is part of a fault-tolerant configuration, do not replace this drive unless all other drives in the array are online. Press **F1** to resume

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1724-Slot *X* Drive Array – Physical Drive Position Change(s) Detected – Logical drive configuration has automatically been updated RESUME = F1 KEY	None	Drive change detected.	The logical drive configuration has been updated automatically following physical drive position changes. Press **F1** to resume.
1726-Slot *X* Drive Array – Array Accelerator Memory Size Change Detected. – Array Accelerator configuration has automatically been updated.	None	Configuration updated.	The array accelerator configuration has been updated automatically due to replacement of the array accelerator (or controller), with one having different cache memory size. Press **F1** to resume.
1727-Slot *X* Drive Array – New Logical Drive(s) Attachment Detected. If more than 32 logical drives, this message will be followed by: "Auto-configuration failed: Too many logical drives."	None	Additional drives detected.	The controller has detected an additional array of drives that was attached when the power was off. The logical drive configuration information has been updated to add the new logical drives. The maximum number of logical drives supported is 32. Additional logical drives will not be added to the configuration. Press **F1** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1729-Slot 1 Drive Array – Disk Consistency Initialization in Progress – RAID 4/5 performance may be lower until Auto Reliability Monitoring has completed Automatic Background Parity Consistency Initialization.	None	Initial RAID configuration in progress.	This message is normal following the initial configuration of RAID 4 or RAID 5 logical drives. Performance of the controller improves after the parity data has been initialized by ARM (an automatic process that runs in the background on the controller).
1730-Fixed Disk 0 does not support DMA Mode.	None	Hard drive error detected.	Run the server setup utility and correct.
1731-Fixed Disk 1 does not support DMA Mode.	None	Hard drive error detected.	Run the server setup utility and correct.
1740-Fixed Disk 0 failed Set Block Mode command	None	Hard drive error detected.	Run the server setup utility and correct.
1741-Fixed Disk 1 failed Set Block Mode command	None	Hard drive error detected.	Run the server setup utility and correct.
1750-Fixed Disk 0 failed Identify command	None	Hard drive error detected.	Run the server setup utility and correct.
1751-Fixed Disk 1 failed Identify command	None	Hard drive error detected.	Run the server setup utility and correct.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1752-Slot *X* Drive Array – This controller is not supported in systems with more than 3 GB of memory. The array controller will be disabled. (RESUME = F1 KEY)	None	The array controller cannot access physical system memory above the 3-GB address range.	Remove the array controller and replace with a version that addresses memory in the required range.
1760-Fixed Disk 0 does not support Block Mode	None	Hard drive error detected.	Run the server setup utility and correct.
1761-Fixed Disk 1 does not support Block Mode	None	Hard drive error detected.	Run the server setup utility and correct.
1764-Slot *X* Drive Array – Capacity Expansion Process is temporarily disabled (followed by one of the following): Expansion will resume when Array Accelerator has been reattached. Expansion will resume when Array Accelerator has been replaced. Expansion will resume when Array Accelerator RAM allocation is successful. Expansion will resume when Array Accelerator battery reaches full charge. Expansion will resume when automatic data recovery has been completed.			Reattach or replace array accelerator, wait until the array accelerator batteries have charged, or for Automatic Data Recovery to complete, as indicated.
1765-Slot *X* Drive Array Option ROM Appears to Conflict With an ISA Card. ISA cards with 16-bit memory cannot be configured in memory range C0000 to DFFFF along with the SMART-2/E 8-bit Option ROM due to EISA bus limitations. Please remove or reconfigure the ISA card.			■ Remove or reconfigure conflicting ISA cards. ■ Disable "shared memory" on any ISA network cards that may be installed.
1766-Slot *X* Drive Array requires System ROM Upgrade. Run Systems ROMPaq Utility.			Run the latest System ROMPaq Utility to upgrade the system ROM as indicated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1767-Slot *X* Drive Array Option ROM is Not Programmed Correctly or may Conflict with the Memory Address Range of an ISA Card. Check the Memory Address Configuration of installed ISA Card(s) or run Options ROMPaq Utility to attempt SMART-2/E Option ROM Reprogramming.			Remove or reconfigure conflicting ISA cards, especially any cards that are not recognized by the server setup utility. Try reprogramming the SMART-2/E Controller ROM using the latest Options ROMPaq Utility (version 2.29 or higher).
1768-Slot *X* Drive Array – Resuming logical drive expansion process	None	SMART-2 Controller error detected.	No action required. This message displays whenever a controller reset or power cycle occurs while array expansion is in progress.
1769-Slot *X* Drive Array – Drive(s) disabled due to failure during expand. Select F1 to continue with logical drives disabled. Select F2 to accept data loss and to re-enable logical drives.	None	SMART-2 Controller error detected.	Data has been lost while expanding the array; therefore, the drives have been temporarily disabled. Press **F2** to accept the data loss and re-enable the logical drives. Restore data from backup.
1770-Slot *X* Drive Array – Critical Drive Firmware Problem Detected – Please upgrade firmware on the following drive(s) using Options ROMPaq (available from www.compaq.com): SCSI Port *Y* SCSI ID *Z* (RESUME = F1 OR F2 KEY)	None	Firmware update need indicated.	The indicated drives are running firmware that is known to cause intermittent problems. Use the Options ROMPaq Utility to upgrade firmware on all drives to the latest revision. Acquire from the Compaq website: http://www.compaq.com/support

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the server setup utility and correct.
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the server setup utility and correct.
1773-Primary Fixed Disk Port Assignment Conflict	None	Hard drive error detected.	Run the server setup utility and correct.
1774-Slot *X* Drive Array – Obsolete data found in Array Accelerator. Select F1 to discard contents of Array Accelerator. Select F2 to write contents of Array Accelerator to drives.	None	SMART-2 Controller error detected.	Data found in array accelerator is older than data found on drives. Press **F1** to discard the older data in the array accelerator and retain the newer data on the drives.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1775-Slot *X* Drive Array – ProLiant Storage System Not Responding SCSI Port *Y*: Check storage system power switch and cables. Turn the system power off while checking the ProLiant power and cable connections, then turn the system power back on to retry.	None	Storage system problem detected.	Power down the system. Check external ProLiant power switch—external drives must all be powered up before or at the same time as the main system. Check cables. If retry does not help, try replacing the cable, firmware, backplane, or the Smart Array Controller.
1776-Slot *X* Drive Array – SCSI Bus Termination Error – Internal and external drives cannot both be secured to the same SCSI port. SCSI port *Y*: Check cables RESUME = F1 Key	None	External and internal connectors of the specified SCSI ports are both attached to drives. The indicated SCSI bus is disabled until this problem is resolved.	The SCSI bus is not properly terminated when internal and external drives are attached concurrently to the same SCSI bus 1. Power down the server 2. Verify cabling to the specified port. 3. Reconfigure drives as indicated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1777-Slot *X* Drive Array – ProLiant Drive Storage Enclosure Problem Detected (followed by one or more of the following): SCSI Port *Y*: Cooling Fan Malfunction Detected SCSI Port *Y*: Overheated Condition Detected SCSI Port *Y*: Side-Panel must be Closed to Prevent Overheating SCSI Port *Y*: Redundant Power Supply Malfunction Detected SCSI Port *Y*: Wide SCSI Transfer Failed SCSI Port *Y*: Interrupt Signal Inoperative (RESUME = F1 KEY)	None	Temperature violation detected.	■ Check cooling fan operation by placing hand over fan. Verify internal plenum cooling fan in tower servers or storage systems is operational. If fan is not operating, check for obstructions and verify all internal connections. Replace unit side panel if removed. ■ If the ProLiant Storage System power LED is amber instead of green, this indicates a redundant power supply failure. ■ Check SCSI cables. If the message indicates to check SCSI cables, verify your cabling against the diagrams in your Compaq Smart Array Controller user guide. If the routing is correct, replace cables on the specified port until the POST message is eliminated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1778-Drive Array resuming Automatic Data Recovery process	None	This message displays whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Slot *X* Drive Array – Replacement drive(s) detected OR previously failed drive(s) now operational: Port *Y*: SCSI ID *Z*: Restore data from backup if replacement drive *X* has been installed.	None	Intermittent drive failure and/or possible loss of data detected.	If this message displays and drive *X* has not been replaced, this indicates an intermittent drive failure. This message also displays immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error detected.	Run Diagnostics. Replace failed assembly as indicated.
1781-Disk 1 Failure	None	Hard drive/format error detected.	Run Diagnostics. Replace failed assembly as indicated.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1782-Disk Controller Failure	None	Hard disk drive circuitry error detected.	Run Diagnostics. Replace failed assembly as indicated.
1783-Slot *X* Drive Array Controller Failure.	None	RDM installation problem or array accelerator board problem detected.	If this message displays immediately following a RDM installation, the RDM is defective or not installed properly. Check to see if the array accelerator board is secured properly. Check that the array controller is firmly inserted in its slot. Try upgrading the System RDM. Otherwise, replace the Smart Array Controller.
1784-Slot *X* Drive Array Drive Failure. The following SCSI drive(s) should be replaced: SCSI Port *Y*: SCSI ID *Z*:	None	Defective drive and/or cables detected.	Check for loose cables. Replace defective drive *X* and/or cable(s).

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1785-Slot *X* Drive Array not Configured (followed by one of the following):	None	Drive array configuration not detected.	
Run Compaq Array Configuration Utility (ACU)			Run the Array Configuration Utility (ACU).
No drives detected			Power down the system and check SCSI cable connections to make sure drives are attached properly.
Drive positions appear to have changed – Run Drive Array Advanced Diagnostics if previous positions are unknown. Then turn system power OFF and move drives to their original positions.			Run Array Diagnostic Utility if previous positions are unknown. Then power down the system and move drives to their original positions.
Configuration information indicates drive positions beyond the capability of this controller. This may be due to drive movement from a controller that supports more drives than the current controller.			To avoid data loss, power down the system and reattach drives to the original controller.
Configuration information indicates drives were configured on a controller with a newer firmware version.			To avoid data loss, reattach drives to the original controller or upgrade the controller firmware to the version on the original controller using the Option ROMPaq Utility.
(RESUME = F1 KEY)			Select **F1** to resume.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1786-Slot 1 Drive Array Recovery Needed. The following SCSI drive(s) need Automatic Data Recovery: SCSI Port 1: SCSI ID 0 Select F1 to continue with recovery of data to drive. Select F2 to continue without recovery of data to drive. -Dr- Slot 1 Drive Array Recovery Needed. Automatic Data Recovery Previously Aborted! The following SCSI drive(s) need Automatic Data Recovery: SCSI Port 1: SCSI ID 0 Select F1 to retry Automatic Data Recovery to drive. Select F2 to continue without starting Automatic Data Recovery data to drive data to drive.	None	System in Interim Data Recovery mode. Data has not yet been recovered.	Press **F1** to allow Automatic Data Recovery to begin. Data is automatically restored to drive *X* once the drive has been replaced or seems to be working. -Dr- 1. Press **F2** for the system to continue to operate in the Interim Data Recovery mode. The "previously aborted" version of the 1786 PDST message displays if the previous rebuild attempt was aborted for any reason. 2. Run Array Diagnostic Utility (ADU) for more information. If the replacement drive was failed, try using another replacement drive. -Dr- If rebuild was aborted due to a read error from another physical drive in the array, back up all readable data on the array, run Diagnostics Surface Analysis, and then restore your data.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1787-Drive Array Dperating in Interim Recovery Mode. Physical drive replacement needed: Drive *X*	None	Hard drive *X* failed or cable is loose or defective. Following a system restart, this message reminds you that drive *X* is defective and fault tolerance is being used.	1. Check for loose cables. 2. Replace defective cables. 3. Replace drive *X* as soon as possible.
*** 1788-Slot *X* Drive Array Reports Incorrect Drive Replacement. The following SCSI drive(s) should have been replaced: SCSI Port *Y* SCSI ID *Z* The following SCSI drive(s) were incorrectly replaced: SCSI Port *y*: SCSI ID *z*. Select F1 to continue – drive array will remain disabled. Select F2 to reset configuration – all data will be lost	None	Drives are not installed in their original positions, so the drives have been disabled. See note below.	1. Reinstall the drives correctly, as indicated. 2. Press **F1** to restart the computer with the drive array disabled. -Dr- Press **F2** to use the drives as configured and lose all the data on them.

*** The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive, noise on the data cable, or a defective SCSI cable. If this message was due to a bad power cable connection, but not incorrect drive replacement, repair the connection and press **F2.** If the message is not eliminated by pressing **F2,** run Array Diagnostic Utility (ADU) to resolve.

-Dr-

If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.

-Dr-

If this message is due to a defective SCSI cable, replace the cable.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1789-Slot *X* Drive Array SCSI Drive(s) Not Responding. Check cables or replace the following SCSI drives: SCSI Port *Y*. SCSI ID *Z* Select F1 to continue – drive array will remain disabled. Select F2 to failed drives that are not responding – Interim Recovery Mode will be enabled if configured for fault tolerance.	None	Cable or hard drive failure occurred.	1. Check the cable connections. 2. If cables are connected, replace the drive. 3. If you do not want to replace the drives now, press **F2.**
1790-Disk 0 Configuration Error	None	Hard drive error or wrong drive type detected.	Run the server setup utility and Diagnostics and correct Replace failed assembly as indicated.
1791-Disk 1 Error	None	Hard drive error or wrong drive type detected.	Run the server setup utility and Diagnostics and correct. Replace failed assembly as indicated.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	Indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Power was then restored within 8 to 10 days, and the data in the array accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the array accelerator.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1792-Secondary Disk Controller Failure	None	Part of the IDE drive electronics has failed.	Run Diagnostics and replace failed assembly as indicated.
1793-Secondary Controller or Disk Failure	None	The IDE controller or an attached drive has failed.	Run Diagnostics and replace failed assembly as indicated.
1793-Drive Array – Array Accelerator Battery Depleted – Data Lost (Error message 1794 also displays.)	None	Indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Array accelerator batteries failed. Data in array accelerator has been lost.	Power was not restored within 8 to 10 days. Perform orderly system shutdowns to avoid data remaining in the array accelerator.
1794-Drive Array – Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	Warning that the battery charge is below 75%. Posted writes are disabled.	Replace the array accelerator board if batteries do not recharge within 36 power-on hours.
1795-Drive Array – Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	Indicates that while the system was in use, power was interrupted while data was in the array accelerator memory. Data stored in the array accelerator does not correspond to this drive array.	Match the array accelerator to the correct drive array, or run the server setup utility to clear the data in the array accelerator.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1796-Drive Array – Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array accelerator is defective or has been removed.	1. Check that the array accelerator is properly seated. 2. Run the server setup utility to reconfigure the Compaq IDA-2 without the array accelerator.
1797-Drive Array – Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost Array Accelerator is disabled.	None	Hard parity error detected while reading data from posted-writes memory.	Enable array accelerator.
1798-Drive Array – Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error detected while writing data to posted-writes memory.	Enable array accelerator.
1799-Drive Array – Drive(s) Disabled due to Array Accelerator Data Loss. Select "F1" to continue with logical drives disabled. Select "F2" to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press **F1** to continue with logical drives disabled or **F2** to accept data loss and re-enable logical drives.

continued

Table 3-2
POST Error Messages *continued*

Error Code	Audible Beeps	Probable Source of Problem	Action
1800-Temperature Alert	None	System has exceeded allowable temperature thresholds.	1. Power down the system and allow it to cool. 2. Check fans for proper airflow and obstructions. 3. Check fans for proper operation. 4. Analyze ambient temperature in which the server is currently operating, and compare to user documentation recommendations. 5. Adjust as needed before restarting the server.

Diagnostics Software

The Test Error Codes tables include all test error codes generated by Compaq products. Each code has a corresponding description and recommended action. Each system generates only those codes that apply to its configuration and options.

When you run Diagnostics and Utilities from the System Configuration Utility main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the SmartStart and Support Software CD and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Create a Diagnostics diskette from the SmartStart and Support Software CD and run Diagnostics from diskette. See procedure in the "Running Compaq Utilities" section earlier in this chapter.

The following options are available from the Diagnostics and Utilities menu:

- Test Computer
- INSPECT Computer
- Upgrade Firmware
- Remote Utilities
- Diagnose Drive Array

Diagnostic error codes are generated when the Diagnostics software recognizes a problem. These error codes help identify possible defective subassemblies.

Steps for Diagnostics

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics utility to verify that the error condition has been corrected. If the error code redisplays:

1. Perform the next step listed in the table.
2. Run the Diagnostics program again.
3. Follow this procedure until the Diagnostics program no longer detects an error condition.

100 – 199, Primary Processor Test Error Codes

The 100 series of diagnostic error codes identifies failures with processor and system board functions.

Table 3-3
Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed.	1. Replace the failed processor and retest. 2. Replace the system board and retest.
103-xx	DMA page registers test failed.	Replace the system board and retest.
104-xx	Interrupt controller master test failed.	
105-xx	Port 61 error.	
106-xx	Keyboard controller self-test failed.	
107-xx	CMOS RAM test failed.	1. Replace the battery/clock module and retest.
108-xx	CMOS interrupt test failed.	2. Replace the system board and retest.
109-xx	CMOS clock load data test failed.	
110-xx	Programmable timer load data test failed.	Replace the system board and retest.
111-xx	Refresh detect test failed.	
112-xx	Speed test slow mode out of range.	
113-xx	Protected mode test failed	
114-xx	Speaker test failed.	1. Verify the speaker connection and retest 2. Replace the system board and retest.
116-xx	Cache test failed.	Replace the processor and retest.
122-xx	Multiprocessor dispatch test failed.	1. Check the system configuration and retest. 2. Replace the processor board and retest.
123-xx	Interprocessor communication test failed.	3. Replace the system board and retest.
199-xx	Installed devices test failed.	1. Check the system configuration and retest. 2. Verify cable connections and retest. 3. Check switch and/or jumper settings and retest. 4. Run the Configuration Utility and retest. 5. Replace the processor board and retest. 6. Replace the system board and retest.

200 – 299, Memory Test Error Codes

The 200 series of diagnostic error codes identifies failures with the memory subsystem.

Table 3-4
Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration.	Reinsert memory modules in correct location and retest.
201-xx	Memory machine ID test failed.	1. Replace the system ROM and retest.
202-xx	Memory system ROM checksum failed.	2. Replace the system board and retest.
203-xx	Memory write/read test failed.	1. Replace the memory module and retest.
204-xx	Memory address test failed.	2. Replace the system board and retest.
205-xx	Walking I/O test failed.	
206-xx	Increment pattern test failed.	
207-xx	Invalid memory configuration—check DIMM installation. DIMMs installed have 8K refresh.	Replace DIMMs.
208-xx	Invalid memory speed detected—check DIMM installation. Slow DIMMs may cause data loss.	Replace DIMMs with timing greater than 60 ns.
210-xx	Random pattern test failed.	1. Replace the memory module and retest. 2. Replace the processor board and retest.

300 – 399, Keyboard Test Error Codes

The 300 series of diagnostic error codes identifies failures with keyboard and system board functions.

Table 3-5
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed.	1. Check the keyboard connection. If disconnected, power down the computer, connect the keyboard, power up the server, and retest. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
302-xx	Keyboard long test failed.	
303-xx	Keyboard LED test, 8042 self-test failed.	
304-xx	Keyboard typematic test failed.	

400 – 499, Parallel Printer Test Error Codes

The 400 series of diagnostic error codes identifies failures with the parallel printer interface or system board functions.

Table 3-6
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected.	1. Connect the printer and retest.
402-xx	Printer data register failed.	2. Check the power to the printer and retest.
403-xx	Printer pattern test failed.	3. Install the loopback connector and retest.
498-xx	Printer failed or not connected.	4. Check the switch on the serial/parallel interface board (if applicable) and retest. 5. Replace the serial/parallel interface board (if applicable) and retest. 6. Replace the system board and retest.

500 – 599, Video Display Unit Test Error Codes

The 500 series of diagnostic error codes identifies failures with video or system board functions.

Table 3-7
Video Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Video controller test failed.	1. Replace the monitor and retest.
502-xx	Video memory test failed.	2. Replace the Server Feature Board and retest.
503-xx	Video attribute test failed.	3. Replace the system board and retest.
504-xx	Video character set test failed.	
505-xx	Video 80x25-mode 9x14 character cell test failed.	
506-xx	Video 80x25-mode 8x8 character cell test failed.	
507-xx	Video 40x25-mode test failed.	
508-xx	Video 320x200-mode color set 0 test failed.	
509-xx	Video 320x200-mode color set 1 test failed.	
510-xx	Video 640x200-mode test failed.	
511-xx	Video screen memory page test failed.	
512-xx	Video gray scale test failed.	
514-xx	Video white screen test failed.	
516-xx	Video noise pattern test failed.	

600 – 699, Diskette Drive Test Error Codes

The 600 series of diagnostic error codes identifies failures with diskette, diskette drive, or system board functions.

Table 3-8
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	1. Replace the diskette and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed.	
602-xx	Diskette read test failed.	
603-xx	Diskette write/read/compute test failed.	
604-xx	Diskette random seek test failed.	
605-xx	Diskette ID media failed.	
606-xx	Diskette speed test failed.	
607-xx	Diskette wrap test failed.	
608-xx	Diskette write protect test failed.	
609-xx	Diskette reset controller test failed.	
610-xx	Diskette change line test failed.	
694-xx	Pin 34 is not cut on 360-KB diskette drive.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media ID error.	1. Replace the media and retest 2. Run the BIOS Setup Utility and retest.

800 – 899, Video Board Test Error Codes

The 800 series of diagnostic error codes identifies failures with video boards or system board functions.

Table 3-9
Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed.	1. Replace monitor and retest.
824-xx	Video text mode test failed.	2. Replace the Advanced VGA board and retest.
		3. Replace the system board and retest.

1100 – 1199, Serial Test Error Codes

The 1100 series of diagnostic error codes identifies failures with serial/parallel interface board or system board functions.

Table 3-10
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	1. Check the switch settings on the serial/parallel interface board (if applicable) and retest
1109-xx	Clock register test failed.	2. Replace the serial/parallel interface board (if applicable) and retest.
		3. Replace the system board and retest.

1200 – 1299, Modem Communications Test Error Codes

The 1200 series of diagnostic error codes identifies failures with the modem.

Table 3-11
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed.	1. Refer to the modem documentation for correct setup procedures and retest.
1202-xx	Modem time-out test failed.	2. Check the modem line and retest.
1203-xx	Modem external termination test failed.	3. Replace the modem and retest.
1204-xx	Modem auto originate test failed.	
1206-xx	Dial multifrequency tone test failed.	
1210-xx	Modem direct connect test failed.	

1700 – 1799, Hard Drive Test Error Codes

The 1700 series of diagnostic error codes identifies failures with hard drives, hard drive controller boards, hard drive cables, and system board functions. If the system uses a drive array controller, see "Array Diagnostic Utility (ADU)" later in this chapter.

Table 3-12
Hard Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Hard drive ID drive types test failed.	1. Ensure that the hard drive signal and power cables are seated properly and retest. 2. Replace the hard drive signal and power cables and retest. 3. Replace the hard drive data cable and retest. 4. Replace the hard drive and retest 5. Replace the Server Feature Board and retest. 6. Replace the system board and retest.
1701-xx	Hard drive format test failed.	
1702-xx	Hard drive read test failed.	
1703-xx	Hard drive write/read/compare test failed.	
1704-xx	Hard drive random seek test failed.	
1705-xx	Hard drive controller test failed.	
1708-xx	Hard drive format bad track test failed.	
1709-xx	Hard drive reset controller test failed.	
1710-xx	Hard drive park head test failed.	
1715-xx	Hard drive head select test failed.	
1716-xx	Hard drive conditional format test failed.	
1717-xx	Hard drive ECC (error checking and correcting) test failed.	
1719-xx	Hard drive power mode test failed.	
1736-xx	Drive Monitoring failed.	
1799-xx	Invalid hard drive type failed.	

1900 – 1999, Tape Drive Test Error Codes

The 1900 series of diagnostic error codes identifies failures with tape cartridges, tape drives, tape drive cables, adapter boards, or the Server Feature Board assembly.

Table 3-13
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed.	1. Replace the tape cartridge and retest
1901-xx	Tape servo write failed.	2. Check and/or replace the signal cable and retest.
1902-xx	Tape format failed.	
1903-xx	Tape drive sensor test failed.	3. Check the switch settings on the adapter board (if applicable).
1904-xx	Tape BOT/EOT test failed.	4. Replace the tape adapter board (if applicable) and retest.
1905-xx	Tape read test failed.	
1906-xx	Tape write/read/compare test failed.	5. Replace the tape drive and retest.
		6. Replace the Server Feature Board and retest.

2400 – 2499, Advanced VGA Board Test Error Codes

The 2400 series of diagnostic error codes identifies failures with video boards, monitors, or the Server Feature Board assembly.

Table 3-14
Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed.	1. Run the BIOS Setup Utility.
2403-xx	Video attribute test failed.	2. Replace the monitor and retest.
2404-xx	Video character set test failed.	3. Replace the Server Feature Board or other video and retest.
2405-xx	Video 80x25-mode 9x14 character cell test failed.	
2406-xx	Video 80x25-mode 8x8 character cell test failed.	
2407-xx	Video 40x25-mode test failed.	
2408-xx	Video 320x320-mode color set 0 test failed.	
2409-xx	Video 320x320-mode color set 1 test failed.	

continued

Table 3-14
Advanced VGA Board Test Error Codes *continued*

Error Code	Description	Recommended Action
2410-xx	Video 640x200-mode test failed.	1. Run the BIOS Setup Utility 2. Replace the monitor and retest. 3. Replace the Advanced VGA board or other video board and retest. 4. Replace the Server Feature Board and retest.
2411-xx	Video screen memory page test failed.	
2412-xx	Video gray scale test failed.	
2414-xx	Video white screen test failed.	
2416-xx	Video noise pattern test failed.	
2417-xx	Lightpen text mode test failed, no response.	
2418-xx	ECG/VGC memory test failed.	
2419-xx	ECG/VGC ROM checksum test failed.	
2420-xx	ECG/VGC attribute test failed.	
2421-xx	ECG/VGC 640x200 graphics mode test failed.	
2422-xx	ECG/VGC 640x350 16-color set test failed.	
2423-xx	ECG/VGC 640x350 64-color test failed.	
2424-xx	ECG/VGC monochrome text mode test failed.	
2425-xx	ECG/VGC monochrome graphics mode test failed.	
2431-xx	640x480 graphics test failure.	
2432-xx	320x200 graphics (256-color mode) test failure.	
2448-xx	Advanced VGA Controller test failed.	
2451-xx	132-column Advanced VGA test failed.	
2456-xx	Advanced VGA 256-color test failed.	
2458-xx	Advanced VGA bit BLT test.	1. Run Setup. 2. Replace the Server Feature Board and retest.
2468-xx	Advanced VGA DAC test.	
2477-xx	Advanced VGA data path test.	
2480-xx	Advanced VGA DAC test.	

6500 – 6599, SCSI Hard Drive Test Error Codes

The 6500 series of diagnostic error codes identifies failures with SCSI hard drives, SCSI hard drive controller boards, SCSI hard drive cables, and system board functions. If the system uses a drive array controller, see "Array Diagnostic Utility (ADU)" later in this chapter.

Table 3-15
SCSI Hard Drive Test Error Codes

Error Code	Description	Recommended Action
6500-xx	SCSI disk ID drive types test failed.	1. Replace the SCSI disk drive data cable and retest.
6502-xx	SCSI disk unconditional format test failed.	2. Replace the SCSI controller and retest.
6505-xx	SCSI disk read test failed.	3. Replace the SCSI disk drive and retest.
6506-xx	SCSI disk SA/media test failed.	4. Replace the Server Feature Board and retest.
6509-xx	SCSI disk erase tape test failed.	
6523-xx	SCSI disk random read test failed.	
6528-xx	Media load/unload test failed.	

6600 – 6699, SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of diagnostic error codes identifies failures with the CD-ROM drive cables, CD-ROM drives, adapter boards, or the system board assembly.

Table 3-16
SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed.	1. Replace the CD-ROM media and retest.
6605-xx	CD-ROM read failed.	2. Check and/or replace the signal cable and retest.
		3. Check the switch settings on the adapter board (if applicable).
		4. Replace the CD-ROM drive and retest.
		5. Replace the system board and retest.

6700 – 6799, SCSI Tape Drive Test Error Codes

The 6700 series of diagnostic error codes identifies failures with tape cartridges, tape drives, media changers, tape drive cables, adapter boards, or the Server Feature Board assembly.

Table 3-17
SCSI Tape Drive Test Error Codes

Error Code	Description	Recommended Action
6700-xx	SCSI tape ID drive types test failed.	1. Replace the SCSI tape drive signal and power cables and retest. 2. Replace the SCSI controller and retest. 3. Replace the SCSI tape drive and retest. 4. Replace the Server Feature Board and retest.
6706-xx	SCSI disk SA/media test failed.	
6709-xx	SCSI disk erase tape test failed.	
6728-xx	Media load/unload test failed.	

8600 – 8699, Pointing Device Interface Test Error Codes

The 8600 series of diagnostic error codes identifies failures with the pointing device (mouse, trackball, and so on) or the system board assembly.

Table 3-18
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing device interface test failed.	1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

Array Diagnostic Utility (ADU)

The Array Diagnostic Utility (ADU) is a Windows-based software tool designed to run on all Compaq servers that support Compaq array controllers installed with SmartStart 4.10 or later. The two main functions of The ADU are to collect all possible information about array controllers in the system and to generate a list of detected problems. The error messages and codes listed include all codes generated by Compaq products. The system generates only codes applicable to the configuration and options in the server.

The ADU works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file. In severe situations, this file can be sent to Compaq for analysis. In most cases, the ADU provides enougb information to initiate problem resolution immediately.

NOTE: The ADU does not write to the drives, destroy data, or change or remove configuration information.

Starting the ADU

1. Insert the SmartStart CD into the CD-ROM drive.
2. Restart the system from the SmartStart CD.
3. Select Array Diagnostic Utility (ADU) from the System Utilities menu.

   A "Please Wait" panel displays, indicating that the ADU is identifying the system parameters. Tbe ADU gathers information from all of the array controllers in the system. The time it takes to gather this information depends on the size of the system. When the information gathering process is complete, the ADU displays the main screen or a panel indicating any problems detected.

   CAUTION: Do not cycle the power during this process. The ADU must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

4. To generate an ADU report, select File, then select Save Data from the Command menu.

Table 3-19
ADU Diagnostic Messages

Message	Description	Recommended Action
Accelerator board not detected	Array controller did not detect a configured array accelerator board.	Install the array accelerator board on the array controller. If an array accelerator board is already installed, check for proper seating on the array controller board.
Accelerator error log	List of the last 32 parity errors on transfers to or from memory on the array accelerator board; displays starting memory address, transfer count, and operation (read and write).	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity read errors: n	Number of times that read memory parity errors were detected during transfers from memory on array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity write errors: n	Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator status. Cache was automatically configured during last controller reset.	Can occur when cache board is replaced with one of a different size.	Normal operations should continue.
Accelerator status. Data in the cache was lost due to some reason other than the battery being discharged	Data in the cache was lost, but not because of the battery being discharged.	Ensure that the array accelerator is properly seated. If the error continues, you may need to replace the array accelerator.
Accelerator status. Dirty data detected has reached limit. Cache still enabled, but writes no longer being posted	Number of cache lines containing dirty data that cannot be flushed (written) to the drives has reached a preset limit. The cache is still enabled, but writes are no longer being posted. This error usually occurs when there is a problem with the drive(s).	Resolve problem with drive(s). The controller can then write dirty data to drives and posted write operations can be restored.
Accelerator status. Dirty data detected. Unable to write dirty data to drives	At least one cache line contains dirty data that the controller has been unable to flush (write) to the drives. This problem usually occurs when there is a problem with the drive(s).	Resolve the problem with the drive(s). The controller can then write dirty data to drives.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Accelerator status: Excessive ECC errors detected in at least one cache line. As a result, at least one cache line is no longer in use	At least one line in the cache is no longer in use due to excessive ECC errors detected during use of the memory associated with that cache line.	Replacement of cache should be considered. If cache replacement is not done, remaining cache lines should continue to operate properly.
Accelerator status: Obsolete data detected	During reset initialization, obsolete data was found in cache. Due to drives being moved and written to by another controller.	Normal operations should continue. The controller either writes data to the drives or discards the data completely.
Accelerator status: Obsolete data was discarded	During reset initialization obsolete data was found in cache and was discarded (not written to drives).	Normal operations should continue.
Accelerator status: Obsolete data was flushed (written) to drives	During reset initialization obsolete data was found in cache. Obsolete data was written to the drives, but newer data may have been overwritten.	If newer data was overwritten, you may need to restore newer data; otherwise, normal operations should continue.
Accelerator status: Permanently disabled	Array accelerator board has been permanently disabled. It remains disabled until it is reinitialized using the Array Configuration Utility (ACU).	Check the Disable Code field. Run Array Configuration Utility (ACU) to reinitialize the array accelerator board.
Accelerator status: Possible data loss in cache	Possible data loss detected during power up due to all batteries being below sufficient voltage level and no presence of identification signatures on the array accelerator board.	There is no way to determine if dirty or bad data was in the cache and is now lost.
Accelerator status: Temporarily disabled	Array accelerator board has been temporarily disabled.	Check the Disable Code field.
Accelerator status: Unrecognized status	A status returned from the array accelerator board that the ADU does not recognize.	Obtain the latest version of the ADU.
Accelerator status: Valid data found at reset	Valid data was found in posted write memory at reinitialization. Data will be flushed to disk.	Not an error or data loss condition. No action required.
Accelerator status: Warranty alert	Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message.	Replace the array accelerator board.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Adapter/NVRAM IO mismatch	EISA nonvolatile RAM has an IO for a different controller from the one physically present in the slot.	Run the BIOS Setup Utility.
Array accelerator battery pack *X* not fully charged	Battery is not fully charged.	If 75% of batteries present are fully charged, array accelerator is fully operational. If less than 75% of batteries are fully charged, allow 36 hours to recharge them.
Array accelerator battery pack *X* below reference voltage (recharging)	Battery pack on array accelerator is below required voltage levels.	Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Board in use by expand operation	Array accelerator memory is in use by Expand operation.	Operate system without array accelerator board until expand operation completes.
Board not attached	Array controller configured for use with array accelerator board, but one is not attached.	Attach array accelerator board to array controller.
Configuration signature is zero	AOU detected that nonvolatile RAM contains a configuration signature of zero. Old versions of the BIOS Setup Utility could cause this.	Run the latest version of BIOS Setup Utility to configure the controller and nonvolatile RAM.
Configuration signature mismatch	Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board.	To recognize the array accelerator board, run the Array Configuration Utility (ACU).
Controller communication failure occurred	Controller communication failure occurred.	AOU was unable to successfully issue commands to the controller in this slot.
Controller detected. NVRAM configuration not present	EISA nonvolatile RAM does not contain a configuration for this controller.	Run the BIOS Setup Utility to configure the nonvolatile RAM.
Controller firmware needs upgrading	Controller firmware is below the latest recommended version.	Run Options ROMPaq Utility to upgrade the controller to the latest firmware revision.
Controller is located in special "video" slot	Controller is installed in slot for special video control signals. If controller is used in this slot, LED indicators on front panel may not function properly.	Install the controller in a different slot and run the BIOS Setup Utility to configure the controller and nonvolatile RAM. Then run the Array Configuration Utility (ACU) to configure controller.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Controller is not configured	Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. ADU examines each physical drive and looks for drives that have been moved to a different drive bay.	Look for messages indicating which drives have been moved. If none displays and drive swapping did not occur, run the Array Configuration Utility (ACU) to configure the controller and run the BIDS Setup Utility to configure nonvolatile RAM. **Do not** run either utility if you believe drive swapping has occurred.
Controller reported PDST error Error Code: *x*	The controller returned an error from its internal PDSTs.	Replace the controller.
Controller restarted with a signature of zero	ADU did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.	Run the BIDS Setup Utility to configure the controller and nonvolatile RAM.
Disable command issued	Posted-writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.	Restart the system. Run the Array Configuration Utility (ACU) to reinitialize the array accelerator board.
Drive (bay) *X* firmware needs upgrading	Firmware on this physical drive is below the latest recommended version.	Run the Options RDMPaq Utility to upgrade the drive firmware to the latest revision.
Drive (bay) *X* has insufficient capacity for its configuration	Drive has insufficient capacity to be used in this logical drive configuration.	Replace this drive with a larger capacity drive.
Drive (bay) *X* has invalid M&P stamp	Physical drive has invalid Monitor and Performance data.	Run the BIDS Setup Utility to properly initialize this drive.
Drive (bay) *X* has loose cable	The array controller could not communicate with this drive at power up. This drive has not previously failed.	Check all cable connections first. The cables could be bad, loose, or disconnected. Power up the system and attempt to reconnect signal/power cable to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.
Drive (bay) *X* is a replacement drive	This drive has been replaced. This message displays if a drive is replaced in a fault-tolerant logical volume.	If the replacement was intentional, allow the drive to rebuild.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Drive (bay) *X* is a replacement drive marked OK	This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when ADU is run, the drive starts working again).	Replace the drive.
Drive (bay) *X* is failed	The indicated physical drive has failed.	Replace the drive.
Drive (bay) *X* is undergoing drive recovery	This drive is being rebuilt from the corresponding mirror or parity data.	Normal operations should occur.
Drive (bay) *X* needs replacing	The 210-megabyte hard drive has firmware version 2.30 or 2.31.	Replace the drive.
Drive (bay) *X* upload code not readable	An error occurred while ADU was trying to read the upload code information from this drive.	If there were multiple errors, this drive may need to be replaced.
Drive (bay) *X* was inadvertently replaced	The physical drive was incorrectly replaced after another drive failed.	Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the BIOS Setup Utility and try to reconfigure; data will be lost.
Drive Monitoring features are unobtainable	ADU unable to get Monitor and Performance data due to fatal command problem such as drive time-out, or unable to get data due to these features not supported on the controller.	Check for other errors (time-outs, and so on). If no other errors occur, upgrade the firmware to a version that supports Monitor and Performance, if desired.
Drive Monitoring is NOT enabled for SCSI Port *x* Drive ID *x*	Monitor and Performance features have not been enabled on this drive.	Run the BIOS Setup Utility to initialize the Monitor and Performance features.
Drive time-out occurred on physical drive bay *X*	ADU issued a command to a physical drive and the command was never acknowledged.	The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.
Drive *X* indicates position Y	Message indicates physical drive that seems to be scrambled or in a drive bay other than the one for which it was originally configured.	Examine the graphical drive representation on ADU to determine proper drive locations. Remove drive *X* and place it in drive position *Y*. Rearrange the drives according to the ADU instructions.
Duplicate write memory error	Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. Not a data loss situation.	Replace the array accelerator board.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Error occurred reading RIS copy from SCSI Port *x* Drive ID *x*	Error occurred while ADU was trying to read the RIS from this drive.	If there were multiple errors, this drive may need to be replaced.
FYI: Drive (bay) *X* is non-Compaq supplied	Installed drive was not supplied by Compaq.	If problems exist with this drive, replace it with a Compaq drive.
Identify controller data did not match with NVRAM	The identify controller data from the array controller did not match the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. It could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.	Check the identify controller data under the INSPECT Utility. If the firmware version field is the only difference between the controller and nonvolatile RAM data, this is not a problem. Otherwise, run the BIDS Setup Utility.
Identify logical drive data did not match with NVRAM	The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.	Run the BIDS Setup Utility to configure the controller and nonvolatile RAM.
Insufficient adapter resources	The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild may be occurring.	Operate the system without the array accelerator board until the drive rebuild completes.
Less than 75% batteries at sufficient voltage	Operation of array accelerator board has been disabled due to less than 75% of battery packs being at sufficient voltage level.	Allow sufficient time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Less than 75% batteries at sufficient voltage. Battery pack *X* below reference voltage.	Battery pack on array accelerator is below required voltage levels	Allow sufficient time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Logical drive *X* failed due to cache error	Logical drive failed due to a catastrophic cache error.	Replace the array accelerator board and reconfigure using the Array Configuration Utility (ACU).

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Logical Drive *X* status = FAILED	This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status occurs. If mirroring is enabled, and any two mirrored drives fail, this status occurs. If Data Guarding is enabled, and two or more drives fail in this unit, this status occurs. This status may also occur if another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state.	Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s), then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.
Logical Drive *X* status = INTERIM RECOVERY	A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable	Replace the failed drive as soon as possible.
Logical Drive *X* status = LOOSE CABLE DETECTED	A physical drive has a cabling problem.	Power down the system and attempt to reattach the cable onto the drive. If this does not work, replace the cable
Logical Drive *X* status = NEEDS RECOVER	A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.	When starting the system, select the "F1 – rebuild drive" option to rebuild the replaced drive.
Logical Drive *X* status = OVERHEATED	The Intelligent Array Expansion System temperature is beyond safe operating levels, and the system has shut down to avoid damage.	Check the fans and the operating environment
Logical Drive *X* status = OVERHEATING	The Intelligent Array Expansion System temperature is beyond safe operating levels.	Check the fans and the operating environment
Logical Drive *X* status = RECOVERING	A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data.	Nothing needs to be done. Normal operations can occur.
Logical Drive *X* status = WRONG DRIVE REPLACED	A physical drive in this logical drive has failed. The incorrect drive was replaced.	Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the System Configuration Utility to reconfigure; data on drive will be lost
Loose cable detected – logical drives may be marked FAILED until corrected	ADU found loose cable. If logical drives are marked FAILED, those logical drives are unusable until the problem is corrected.	Power down the system. Check cable(s) for tight connection to logical drives. Restart system. If same message recurs, cable(s) may be bad.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Loose cable detected – logical drives may be marked FAILED until corrected	Controller unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller.	Check all controller and drive cable connections.
Mirror data miscompare	Data was found at reinitialization in the posted write memory, however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.	Replace the array accelerator board.
No configuration for accelerator board	Array accelerator board has not been configured.	If the array accelerator board is present, run the Array Configuration Utility (ACU) to configure the board.
NVRAM configuration present, controller not detected	EISA nonvolatile RAM has a configuration for an array controller, but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.	Place the array controller in the proper slot or run the BIDS Setup Utility to reconfigure nonvolatile RAM to reflect the removal or new position.
RIS copies between drives do not match	Drives on controller contain copies of RIS that do not match.	Upgrade ADU to the most recent version.
SCSI Port *x* Drive ID *x* has exceeded threshold(s)	Monitor and performance threshold for this drive has been violated.	Check for the particular threshold that has been violated.
SCSI Port *x* Drive ID *x* is not stamped for monitoring	Drive has not been stamped with Monitor and Performance features.	Run the Array Configuration Utility (ACU). Changing the configuration and saving should cause ACU to stamp drive with Monitor and Performance features. To do this without destroying the current configuration, change array accelerator size and save configuration. Change the array accelerator back to original size and save again.
SCSI Port *x* Drive ID *x* RIS copy mismatch	Copies of RIS on drive do not match.	Drive may need to be replaced. Check for other errors.
SCSI Port *x* Drive ID *x* failed – REPLACE (failure message)	ADU found drive that needs to be replaced.	Replace drive or correct condition that caused error.
SCSI Port *x* Drive ID *x* firmware needs upgrading	Drive firmware is below recommended version.	Run Options RDMPaq Utility to upgrade drive to latest firmware revision.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
SCSI Port *x* Drive ID *x* has a loose cable. SMART is unable to communicate with drive	Drive has loose cable.	Power down the system. Check drive cable for tight connection.
SCSI Port *x* Drive ID *x* was replaced on a good volume (failure message)	ADU found drive was replaced even though volume was fine.	No action needed.
SCSI port *X*, drive ID Y firmware needs upgrading	Drive firmware may cause problems and should be upgraded.	Run Dptions RDMPaq Utility to upgrade the firmware on the drive to a later version
Set configuration command issued	The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized.	Run the BIDS Setup Utility to reinitialize the array accelerator board.
Soft Firmware Upgrade required	ADU has determined that the controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system	Run the Compaq Upgrade Utility to place the latest firmware on all drives.
Unable to communicate with drive on SCSI Port *x*, Drive ID *x*	Controller could not communicate with drive.	If the amber LED on the drive is on, replace the drive.
Unknown disable code	A code was returned from the array accelerator board that ADU does not recognize.	Dbtain the latest version of ADU.
Unrecoverable read error	Read parity errors were detected when attempting to read same data from both sides of mirrored memory. Data loss will occur.	Replace the array accelerator board.
WARNING – Drive Write Cache is enabled on *X*	Drive has its internal write cache enabled. The drive may be a third-party drive, or the operating parameters of the drive may have been altered. This condition may cause data corruption if power to the drive is interrupted.	Replace the drive with a drive supplied by Compaq, or restore the operating parameters of the drive.

continued

Table 3-19
ADU Diagnostic Messages *continued*

Message	Description	Recommended Action
Warning bit detected	A Monitor and Performance threshold violation may have occurred. Status of a logical drive may not be OK.	Check the other error messages on the diagnosis screen for an indication of the problem.
Write memory error	Data could not be written to cache memory. This typically means that parity error was detected while writing data to cache. This could be caused by incomplete connection between cache and controller. This is not a data loss circumstance.	With the system powered down, verify that the cache board is fully connected to the controller.
Wrong Accelerator	This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by AOU and a message indicating the type of adapter last configured in EISA nonvolatile RAM.	Check the diagnosis screen for other error messages. Run the BIOS Setup Utility to update the system configuration.

Integrated Management Log (IML)

The Compaq Integrated Management Log (IML) replaces the Critical Error Log and Correctable Memory Logs. IML records system events and stores them in an easily viewable form. Each event is marked with a time-stamp with one-minute granularity.

Events listed in the IML are categorized as one of four event severity levels:

- **Status**—indicates that the message is informational only.
- **Repaired**—indicates tbat corrective action bas been taken.
- **Caution**—indicates a nonfatal error condition.
- **Critical**—indicates a component failure.

The IML requires Compaq operating system-dependent drivers. Refer to the Support Software CD for instructions on installing the appropriate drivers.

Multiple Ways of Viewing the IML

You can view an event in the IML from within thc:

- Compaq Insight Manager
- Compaq Survey Utility
- IML Management Utility
- Compaq IML Viewers

Compaq Insight Manager

Compaq Insight Manager is a comprehensive management tool used to monitor and control the operation of Compaq servers and clients. Compaq Insight Manager consists of two components: a Windows-based console application, and server- or client-based management data collection agents. Starting with Compaq Insigbt Manager 4.0, the agents for Microsoft Windows NT and Novell NetWare are also Web-enhanced; that is, these agents enable Web browser access and monitoring of management information.

The management agents monitor over 1,000 management parameters. Key subsystems are instrumented to make health, configuration, and performance data available to agent software. Agents act upon data by initiating information, sucb as statistics on network interface or storage subsystem performance.

Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server, then select View Device Data. The selected server displays, with buttons around its perimeter.
2. Select the Recovery button, and then the Integrated Management Log.
3. If a failed component has been replaced, select the event from the list. Then select Mark Repaired for the failed component in the Insight Manager.

Printing the Event List

1. From the Compaq Insight Manager screen, select the appropriate server.
2. Select the Configuration button, then the Recovery button, and then Print.

Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available on the SmartStart CD. It delivers online-configuration capture and comparison to maximize server availability. It is delivered on the Compaq Management CD in the SmartStart package or is available on the Compaq website. Refer to the Management CD for information on installing and running the Compaq Survey Utility.

After running the Survey Utility, view the IML by loading the output of the utility (typically called "survey.txt") into a text viewer such as Microsoft Notepad. The event list follows the system slot information. After opening the text file, print it using the print feature of the viewer.

Compaq IML Viewer

Compaq provides IML Viewer utilities for Microsoft Windows NT 4.x, Novell NetWare, SCO OpenServer 5.05, and SCO UnixWare 7. The OS-based tools give you the ability to review, mark corrected, save, clear, and print (in some operating systems) events from the IML. The utilities are located on the corresponding OS Support Software Diskette (SSD) or Extended Feature Supplement (EFS), shipped on the SmartStart and Support Software CD. Refer to the help files on the specific SSD/EFS for information on how to install and use the IML Viewer for your operating system.

Event List

The Event List displays the affected components and the associated error messages. Though the same basic information displays, the format of the list may differ, depending on how you view it: on the IMD, from within Compaq Insight Manager, or the Compaq Survey Utility. An example of the format of an event displayed on the IMD as follows:

```
**001 of 010**
---caution---
03/19/1997
12:54 PM
FAN INSERTEO
Main System
Location:
  System Board
Fan IO: 03
**ENO OF EVENT**
```

Event Messages

Table 3-20
Event Messages

Event Type	Event Message	Action
Machine Environment		
Fan Failure	System Fan Failure (Fan *X*, Location).	Replace fan.
Fan Inserted	System Fan Inserted (Fan *X*, Location).	None
Fan Removed	System Fan Removed (Fan *X*, Location)	None
Fans Not Redundant	System Fans Not Redundant.	Add fan.
Overheat Condition	System Overheating (Zone *X*, Location).	Check fans.
Main Memory		
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot *X*, Memory Module *X*).	Replace the defective memory module.
	Corrected Memory Error threshold passed (System Memory).	Replace memory modules one at a time (if more than one) and retest the system after each replacement.
	Corrected Memory Error threshold passed (Memory Module unknown).	Replace the memory modules one at a time (if more than one).
Uncorrectable Error	Uncorrectable Memory Error (Slot *X*, Memory Module *X*).	Replace the defective memory module.
	Uncorrectable Memory Error (System Memory).	Replace the defective memory module.
	Uncorrectable Memory Error (Memory Module unknown).	Replace memory modules one at a time (if more than one) and retest the system after each replacement.

continued

Table 3-20
Event Messages *continued*

Event Type	Event Message	Action
Processor		
Correctable Error Threshold exceeded	Processor Correctable Error Threshold passed (Slot *X*, Socket *X*).	Replace the processor.
Uncorrectable Error	Unrecoverable Host Bus Data Parity Error.	Replace the processor.
Host Bus Error	Unrecoverable Host Bus Address Parity Error.	Call the Compaq authorized service provider or Compaq for diagnosis.
PCI Bus Error	PCI Bus Error (Slot *X*, Bus *X*, Device *X*, Function *X*).	Power down PCI slot and replace board
Power Subsystem		
Power Supply Failure	System Power Supply Failure (Power Supply *X*).	Replace power supply.
Power Supply Inserted	System Power Supply Inserted (Power Supply *X*).	None
Power Supply Removed	System Power Supply Removed (Power Supply *X*).	None
Power Supply Not Redundant	System Power Supplies Not Redundant.	Add power supply.
System Configuration Battery Low	Real-Time Clock Battery Failing.	Replace battery.
Power Module Failure	A CPU Power Module (System Board, Socket *X*).	Replace power module
Power Module Failure	A CPU Power Module (Slot *X*, Socket *X*).	Replace power module
Power Modules Not Redundant	System Power Modules Not Redundant.	Add power module.
AC Voltage Problem	System AC Power Problem (Power Supply *X*).	Check the input power voltage.
Power AC Overload	System AC Power Overload (Power Supply *X*).	■ Change the input power to 220 V. ■ Add an additional power supply, or replace with one able to supply present load. ■ Reduce the load.

continued

Table 3-20
Event Messages *continued*

Event Type	Event Message	Action
Automatic Server Recovery		
System Lockup	ASR Lockup Detected: Cause	Call the Compaq authorized service provider or Compaq for diagnosis.
Operating System		
System Crash	Blue Screen Trap: Cause [NT] Kernel Panic: Cause [UNIX] Abnormal Program Termination: Cause [NetWare]	Refer to the documentation for the operating system.
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure Automatic Operating System Shutdown Initiated Due to Overheat Condition Fatal Exception (Number *X*, Cause)	Refer to the documentation for the operating system.

Rapid Error Recovery

Compaq servers provide rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery.

Rapid recovery means fast identification and resolution of complex faults. The Rapid Recovery Engine and Insight Management Agents notify the system administrator when a failure occurs, ensuring that the server experiences minimal downtime. These integrated server management features are:

- Automatic Server Recovery (ASR)
- Integrated Management Log (IML) Messages
- Storage Fault Recovery Tracking
- Storage Automatic Reconstruction
- Network Interface Fault Recovery Tracking
- Memory Fault Recovery Tracking

These are discussed in more detail on the server documentation CD.

Automatic Server Recovery

Automatic Server Recovery (ASR) lets the server restart automatically after a catastrophic operating system failure.

The available recovery features are:

- **Software Error Recovery**—automatically restarts the server after a software-induced server failure
- **Environmental Recovery**—allows the server to restart when temperature, fan, or AC power conditions return to normal

Unattended Recovery

For unattended recovery, ASR performs the following actions:

- Logs the error information to the IML
- Resets the server
- Tries to restart the operating system

Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available. The Server Management Driver (the Health Driver) automatically enables ASR when the driver is loaded.

Table 3-21
ASR Features

Feature	Definition
Software error recovery	If enabled, ASR is activated if the OS hangs or has a crash that results in a lockup.
Thermal shutdown	If enabled, shuts down the server if a critical thermal error occurs.
UPS shutdown	If enabled, allows the server to perform a shutdown if a UPS is activated.
UPS shutdown threshold	Determines how long the server waits to shut down after the UPS is activated. If desired, this number should provide enough time for an administrator to perform any necessary operations or to gracefully shut down the server.

Compaq Server Management Driver

The Compaq Server Management Driver resets the ASR timer continually. The timer is set to expire in 10 minutes. If the ASR timer counts down to zero before being reset, due to an operating system crash or a server lockup, ASR restarts the server.

The Server Management Driver is independent of the ASR timer. You should load it and enable the ASR timer. This step allows the driver to detect and log information in the IML regarding numerous hardware and software errors. However, you cannot enable the ASR timer without loading the Compaq Server Management Driver. The Server Management Driver provides many benefits in addition to ASR, including ECC error detection, CPU processor memory, and hard drive pre-failure support. Also, the Server Management Driver works with Compaq Insight Manager to provide a complete systems management solution.

The following ASR flowchart shows you the sequence of events after a hardware or software error occurs:

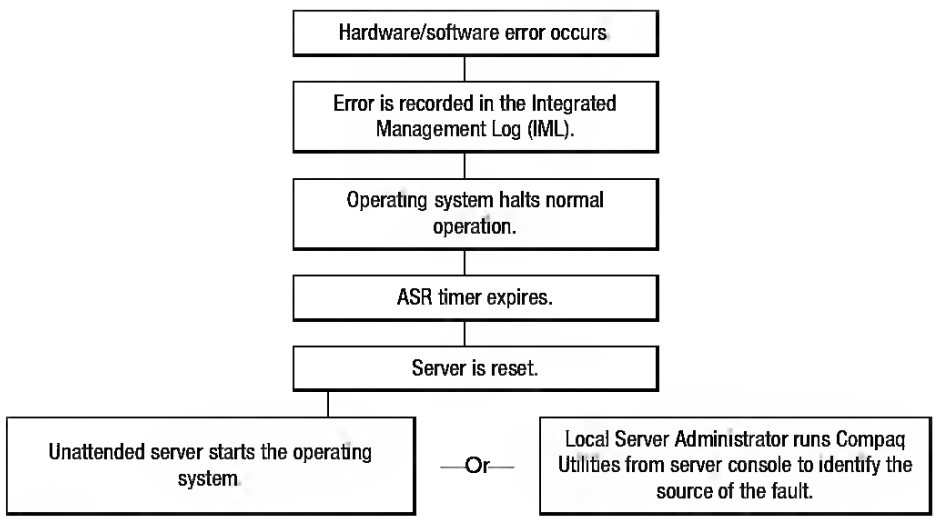

Hardware/software error occurs
Error is recorded in the Integrated Management Log (IML).
Operating system halts normal operation.
ASR timer expires.
Server is reset.
Unattended server starts the operating system
—Or—
Local Server Administrator runs Compaq Utilities from server console to identify the source of the fault.

Figure 3-1. ASR flowchart

ASR Security

The standard Compaq password features function differently during ASR than during a typical system startup. During ASR, the system does not prompt for the power-on password. This action allows ASR to restart the operating system without user intervention.

ASR Integrated Management Log (IML) Messages

The Integrated Management Log (IML) records memory errors, as well as catastrophic hardware and software errors, that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the IML through Compaq Insight Manager. The Diagnostics Utility either resolves the error or suggests corrective action in systems that do not support event logs.

The IML identifies and records all the errors in Table 3-22.

Table 3-22
ASR IML Messages

Message	Description
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR detected by ROM	An ASR activity has been detected and logged by the system ROM.
ASR Test Event	The System Configuration Utility generated a test alert.
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery (ASR) timer expiration.
Automatic Server Recovery Memory Parity Error	Corrupt system memory caused the OS to crash. Run Diagnostics to identify the failed DIMM.
Battery Failing	Low system battery warning. Replace battery within 7 days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the nonvolatile RAM in the system is imminent.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Diagnostic Error	An error was detected by the Diagnostics Utility. See the specific error code in this chapter for a detailed explanation.
Error Detected On Boot Up	The server detected an error during POST.
Processor Prefailure	A CPU has passed an internal corrected error threshold; excessive internal ECC cache errors.
NMI – PCI Bus Parity Error	A parity error was detected on the PCI bus.
NMI – Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a server failure.
NMI – Expansion Bus Master Time-Out	A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure.
NMI – Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure.

continued

Table 3-22
ASR IML Messages *continued*

Message	Description
NMI – Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a server failure.
Processor Exception	The indicated processor exception occurred.
NMI – Processor Parity Error	The processor detected a data error, resulting in a server failure.
NMI – Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a server failure.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes whether an auto-shutdown sequence has been invoked by the operating system.
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR Test Event	A test program caused ASR.
NMI – Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR timer expiration.
Required System Fan Failure	The required system fan has failed. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
UPS A/C Line Failure Shutdown or Battery Low	The UPS notified the operating system that the AC power line has failed. Accompanying data indicates whether either an auto-shutdown sequence has been invoked or the battery is nearly depleted.
ASR detected by ROM	An ASR activity has been detected and logged by the system ROM.

Storage Fault Recovery Tracking

This feature tracks over 12 failure-indication parameters, such as timeouts, spin-up, and self-test errors of SCSI drives. You can use these parameters to pinpoint failed storage subsystem components and to recover from a controller or hard drive failure.

Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure the server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation if a drive fails.

Network Interface Fault Recovery Tracking

This feature tracks over 20 failure indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and Token-Ring network interfaces. It decreases network downtime by enabling diagnosis of actual network interface failures.

Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for uncorrectable memory errors.

ROMPaq Error Recovery Options

From time to time it may be desirable to upgrade the current system ROM. Some reasons for this may be as follows:

- Customer desires ROM upgrade
- Obtained new SmartStart CD-ROM
- Desire to upgrade server processors
- Request from Compaq

The process of upgrading the system ROM is referred to as flasbing the ROM. Flashing consists of using software to replace the current ROM image with a new one through ROMPaq.

Should an error such as a power failure occur during this process, the flash operation cannot be completed, causing the ROM image in the server to be corrupted. Compaq provides two options for ROMPaq recovery, depending on the server and circumstances involved.

ROMPaq Disaster Recovery

The following option should be utilized by any server that does not have a valid ROM image.

1. Build a fresh ROMPaq diskette, using the latest version for the server involved.
2. Power down the server.
3. Set configuration switch SW1.4 on the system maintenance switch block to On to enable disaster mode.

Table 3-23
System Board SW1 Configuration Switches

Switch	Function	Default
1	Clear password	Off
2	Clear configuration	Off
3	Tower/rack configuration	Off (tower)
4	Enter BIOS disaster recovery mode	Off

4. Insert the ROMPaq diskette. Although you use a normal ROMPaq diskette, this situation does not allow you to save the old image.
5. Power up the server. The keyboard, mouse, and monitor are all inactive.
6. The server makes two long beeps to indicate that you are in Disaster Recovery Mode and that you should insert the ROMPaq diskette.
7. The server reads the diskette for the latest ROM image. If the diskette is not in place, the system continues to beep until a valid ROMPaq diskette is inserted.
8. The ROMPaq diskette flashes the system ROM.
9. A series of increasing tones indicates disaster recovery is complete and successful.
10. A series of decreasing tones indicates disaster recovery bas failed.
11. After successful completion of this process,
    a. Power down the server
    b. Restore System BIOS SW1 Configuration Switch to its normal position.
    c. Power up the server as usual.

After a failed ROMPaq, power down the server and repeat the above process.

Compaq Insight Manager

Compaq Insigbt Manager is the Compaq application for easily managing networked systems. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of the servers.

In Compaq servers, every hardware subsystem, such as disk storage, system memory, and system processor, bas a robust set of management capabilities. Compaq Full-Spectrum Fault Management prevents faults before they happen, keeps the system up and running in the unlikely event of a failure, and delivers rapid server recovery to normal operation after a fault.

Compaq Insight Management Software Features

Compaq Insigbt Management features include:

- **Web browser access**—to Insigbt Manager Device and Configuration information from anywbere you have network access and a standard Web browser for Windows NT and NetWare servers.
- **Comprehensive fault management**—for all major subsystems, including pre-failure alerts in advance of potential system failures.
- **Broad configuration management**—provides effective deployment and maintenance of consistent, manageable configurations with Insight Version Control and Integration Server Maintenance. Version Control and Integration Server Maintenance allows the administrator to monitor and update versions of the server and workstation firmware, drivers and utilities.
- **Performance management**—sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more.
- **Workstation management**—monitors and manages Compaq Professional Workstations.
- **Client management**—manages faults and assets on Compaq Deskpro computers.
- **Netelligent management**—receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software.
- **Asset management**—exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications.
- **Remote management**—manages in-band or out-of-band devices, online or offline, from any location.
- **Integration witb enterprise management platforms**—provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.
- **Full integration with Compaq Remote Insight Board/PCI**—allows "in-band" and "out-of-band" connection for server management to ensure that customers are in toucb with their systems, even when they are offline or without power.

- **SNMP standards**—allow integration with other management products.
- **Flexible network conductivity**—supports multiple transport protocols including IPX, TCP/IP, and PPP to operator over LANs, WANs, and modems.
- **Support for these operating systems**:
  - Microsoft Windows NT
  - Novell NetWare, intraNetWare and intraNetWare for Small Business
  - SCO UNIX, OpenServer, and UnixWare
- **Reporting**—using Automatic Data Collection, gathers historic performance information for graphing or export purposes.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is typical of other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Management Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers, monitoring functions that include temperature sensing and disk pre-failure alerting.

Insight Agents provide information to management applications, such as Compaq Insight Manager, and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol (SNMP).

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of the Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the server documentation CD that accompanied the server.

Chapter 4

Connectors, Switches, and LED Indicators

This chapter contains locations and descriptions of the following ProLiant ML350 server components:

- Connectors on the system board, rear panel, and Server Feature Board
- Switches on the system board and Server Feature Board
- LED (status) indicators

Connectors

This section contains graphics and tables identifying connector locations on the system board, rear panel, and Server Feature Board.

System Board Components

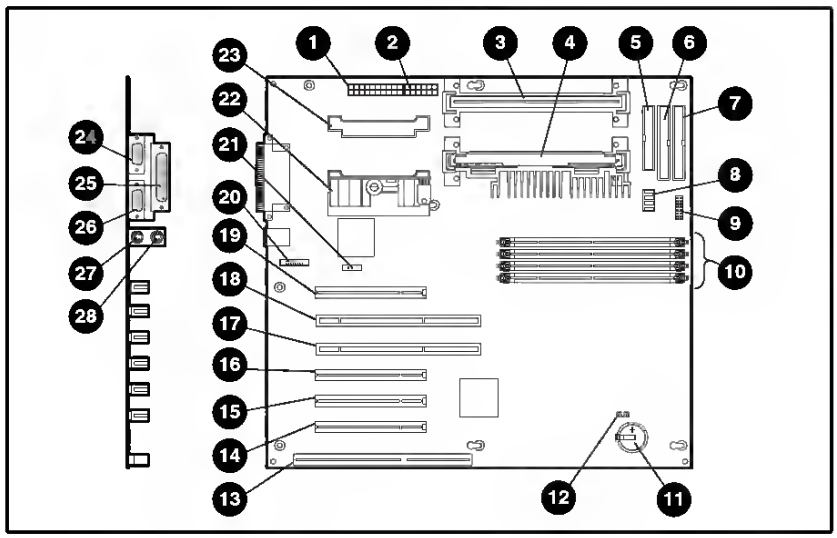


Figure 4-1. System board components

Table 4-1
System Board Components

Item	Description	Item	Description
1	Power supply connector	15	32-bit PCI slot 5
2	Power supply connector	16	32-bit PCI slot 4
3	Processor slot 2	17	64-bit PCI slot 3
4	Processor slot 1	18	64-bit PCI slot 2
5	Diskette drive connector	19	32-bit PCI slot 1 (Server Feature Board)
6	Primary IDE connector	20	Server Management Information Connector (SMIC)
7	Secondary IDE connector	21	System fan connector
8	System configuration switch (SW1)	22	Processor Power Module (PPM) 1 connector
9	Power switch connector	23	Processor Power Module (PPM) 2 connector
10	DIMM slots	24	Serial port A connector
11	Battery	25	Parallel port connector
12	Virtual power button connector	26	Serial port B connector
13	ISA slot 7	27	Keyboard connector
14	32-bit PCI slot 6	28	Mouse connector

Rear Panel Components

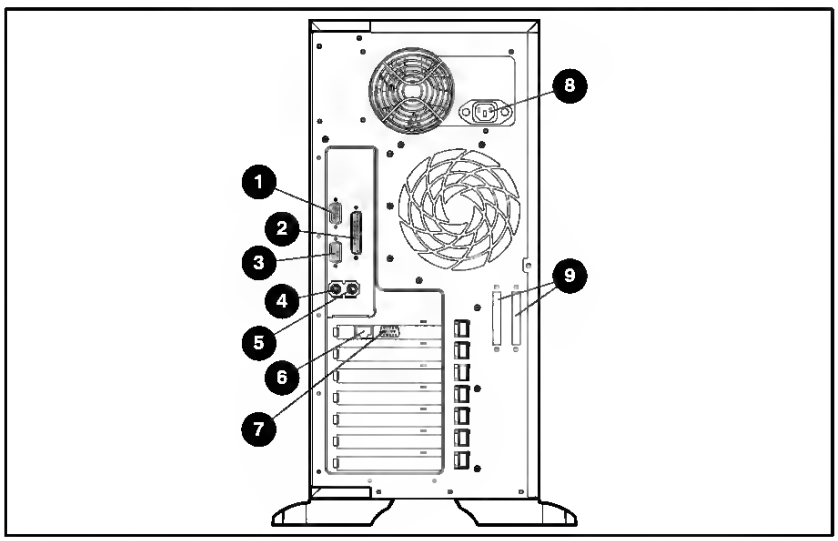


Figure 4-2. Rear panel components

Table 4-2
Rear Panel Components

Item	Description	Item	Description
1	Serial port A connector	6	RJ-45 Ethernet port
2	Parallel port connector	7	Video connector
3	Serial port B connector	8	Power cord connector
4	Keyboard connector	9	SCSI knockouts
5	Mouse connector		

Server Feature Board Components

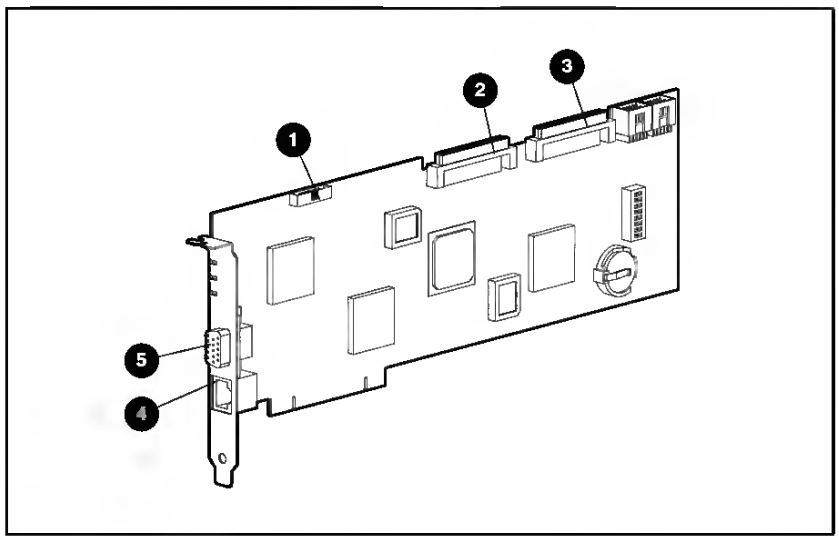


Figure 4-3. Server Feature Board components

Table 4-3
Server Feature Board Components

Item	Description	Item	Description
1	Server Management Information Cable (SMIC) connector	4	RJ-45 Ethernet port
2	SCSI channel A connector	5	Video connector
3	SCSI channel B connector		

Switches

This section contains graphics and tables showing switch locations on the ProLiant ML350 server system board and Server Feature Board.

System Board Configuration Switchbank Settings

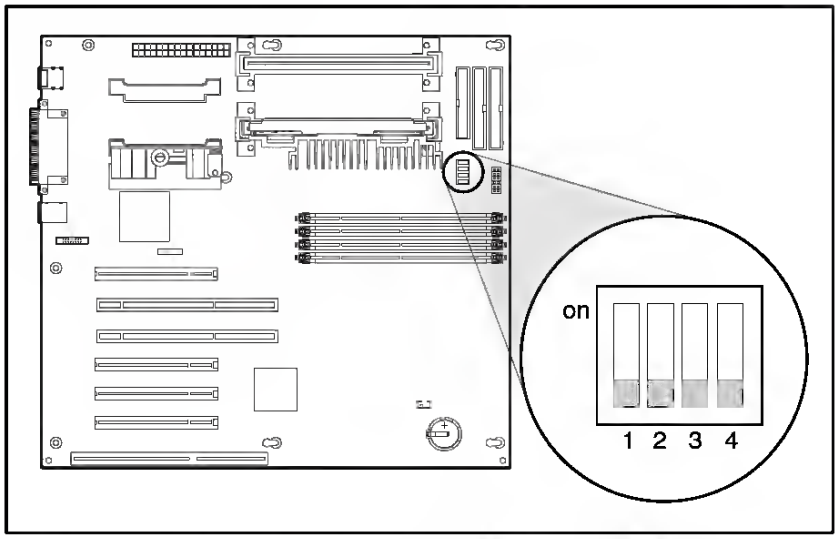


Figure 4-4. System board configuration switchbank location and default settings (SW1)

Table 4-4
System Board Configuration Switchbank Settings (SW1)

Switch	Function	Default Position
1	Clear setup and power-on passwords	Off
2	Clear CMOS configuration settings	Off
3	Tower/rack	Off (tower)
4	ROMPaq disaster recovery	Off (normal)

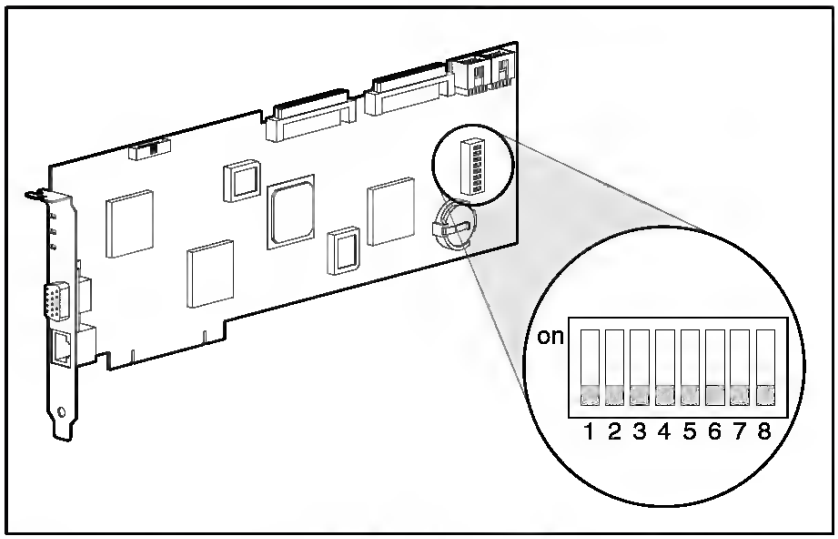


Figure 4-5. Server Feature Board configuration switchbank location and default settings (SW3)

Table 4-5
Server Feature Board Configuration Switchbank Settings (SW3)

Switch	Function	Default Position
1	On = Disable Video	Off
2	Reserved	Off
3	Reserved	Off
4	Reserved	Off
5	Reserved	Off
6	Reserved	Off
7	Reserved	Off
8	Reserved	Off

LED (Status) Indicators

This section contains graphics information for the following ProLiant ML350 server components:

- Power and hard drive activity indicators
- Integrated Network Controller status indicators
- Auxiliary power indicator

Power and Hard Drive Activity Indicators

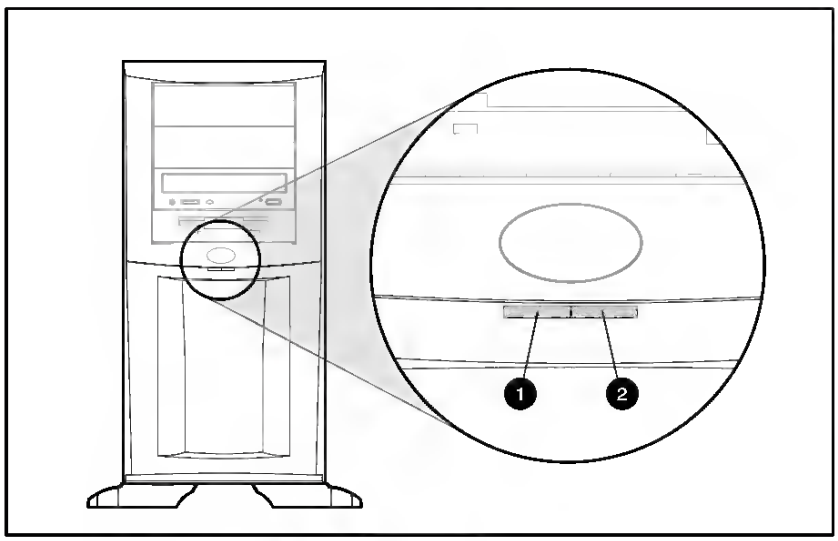


Figure 4-6. Power and hard drive activity indicators

Table 4-6
Power and Hard Drive Activity Indicators

Item	Status	Condition
1	Off	System is off.
	Flashing	System is in standby power state
	On	System is on.
2 *	Off	No hard drive activity on embedded SCSI controller.
	On/flashing	Hard drive on embedded SCSI controller is being accessed.

* This item indicates activity only for devices connected to the integrated Fast Wide Dual Channel Ultra2 SCSI Controller.

CAUTION: When the power indicator is on or flashing, it is unsafe to remove the AC power from the system.

Integrated Network Controller Status Indicators

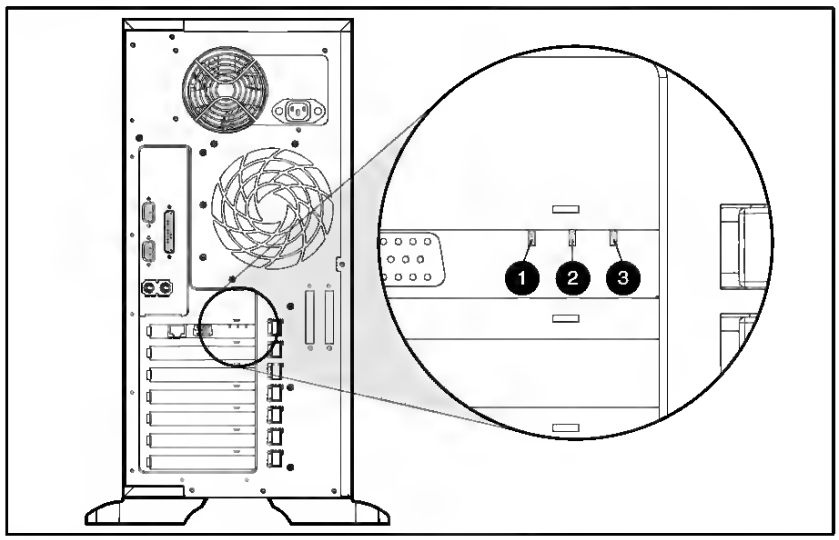


Figure 4-7. Integrated Network Controller status indicators

Table 4-7
Integrated Network Controller Status Indicators

Item	Description	Status	Condition
1	Link	Off	No network link
		On	Linked to the network
2	Speed	Off	10Base-T 10 Mbps (10Base-T Ethernet)
		On	100Base-TX 100 Mbps (100Base-TX Ethernet)
3	Activity	Off	No network activity
		On or flashing	Network activity

Auxiliary Power Indicator

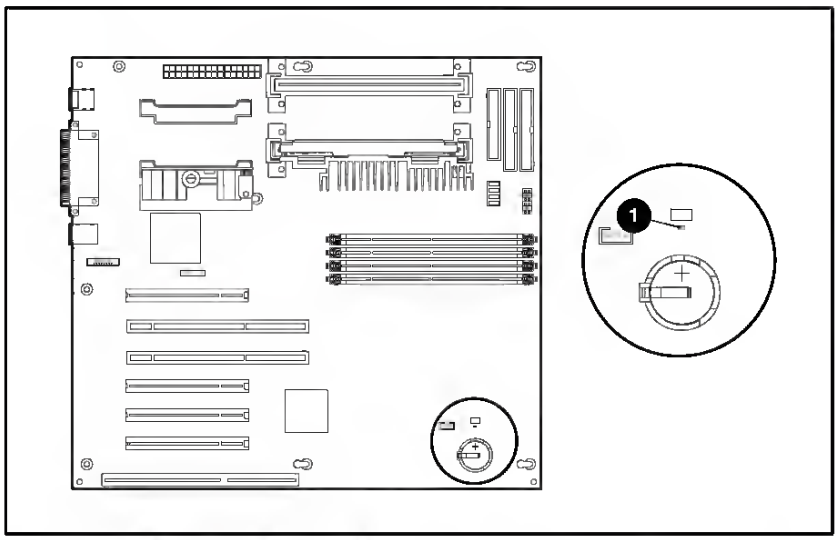


Figure 4-8. Auxiliary power indicator location

CAUTION: If the auxiliary power indicator is illuminated, power is being supplied to your system. Do not attempt to service the server while power is supplied.

Table 4-8
Auxiliary Power LED Indicator

Item	Status	Condition
1	Off	No power is supplied to the system board.
	On	Power is supplied to the system board.

Chapter 5

Physical and Operating Specifications

This chapter provides specifications for the Compaq ProLiant ML350 server. The following specifications are provided:

- System Unit
- Memory
- 1.44-MB Diskette Drive
- IDE CD-ROM Drive
- Wide Ultra2 SCSI Hard Drives
- Compaq NC3163 Fast Ethernet Embedded NIC
- Dual Channel Wide Ultra2 SCSI Adapter

System Unit

Table 5-1
System Unit Specifications

Dimensions	
Height	44.45 cm/46.99 cm with feet (17.5 inch/18.5 inch with feet)
Width	21.59 cm/26.67 cm with feet (8.5 inch/10.5 inch with feet)
Depth	60.96 cm/66.04 cm with feet (24 inch/26 inch with feet)
Weight	27.24 kg (60 lb) weight approximate, depending upon options
International input requirements	
Rated input voltage	200 to 240 VAC
Rated input frequency	50-60 Hz
Rated input current	3 A
U.S. input requirements	
Rated input voltage	100 to 120 VAC
Rated input frequency	50 to 60 Hz
Rated input current	6 A
Power supply output power	
Rated steady state power	300W
Maximum peak power	400W
BTUs for tower model and rack option	1,560
Temperature range	
Operating	10° to 35°C/ 50° to 93°F
Nonoperating	-29° to 60°C/ -20° to 140°F
Relative humidity (noncondensing)	
Operating	20% to 80%
Nonoperating	5% to 90%
Acoustic noise	
Idle (hard drives spinning)	6 NPEL (BELS)/43 AVERAGE SPL (dba)
Operating (random seeks to hard drives)	6.1 NPEL (BELS)/44 AVERAGE SPL (dba)

Memory

Table 5-2
ECC SDRAM Specifications

Size	64-, 128-, 256-, and 512-MB
Speed	PC 133-MHz
Type	Registered ECC SDRAM DIMMs

1.44-MB Diskette Drive

Table 5-3
1.44-MB Diskette Drive

Size	88.9-mm (3.5-inch)
LED indicators (front panel)	Green
Read/write capacity per diskette (high/low density)	1.44-MB/720-KB
Drives supported	1
Drive height	Third, 1-inch
Drive rotation	300 rpm
Transfer rate bits/sec (high/low)	500-K/250-K
Bytes/sector	512
Sectors per rack (high/low)	18/9
Tracks per side (high/low)	80/80
Access times	
Track-to-track (high/low)	3 ms/6 ms
Average (high/low)	169/94 ms
Settling time	15 ms
Latency average	100 ms
Cylinders (high/low)	80/80
Read/write heads	2

IDE CD-ROM Drive

Table 5-4
IDE CD-ROM Specifications

Applicable disk	CD-ROM (modes 1 and 2); mixed mode (audio and data combined); CD-DA; Photo CD (single- and multiple-session), CD-XA (mode 2, forms 1 and 2); CDI ready; CD-WO
Capacity	650-MB
Rotational speed	5,200 rpm
Block size	2,048, 1,024 bytes (mode 1)
	2,340, 2,336, 1,024 bytes (mode 2)
	2,352 bytes (CD-DA)
	2,328 bytes (CD-XA)
Dimensions	
Height	42.9-mm (1.69-inch)
Width	208.0-mm (8.2-inch)
Depth	150.1-mm (5.91-inch)
Weight	0.950-kg (2.09-lb)
Data transfer rate	
Sustained	150 KBps (single), 1,500 to 6,000 KBps (10X to 40X)
Burst	150 to 6,000 KBps
Interface	IDE (ATAPI)
Access times (typical)	
Full stroke	<150 ms
Random	<100 ms
Diameter	12-cm, 8-cm (4.7-inch, 3.15-inch)
Center hole	15-mm (0.6-inch)
Thickness	1.2-mm (0.05-inch)
Track pitch	1.6 µm
Cache/buffer	128 KB
Startup time	<7 seconds
Stop time	<4 seconds

continued

Table 5-4
IDE CD-ROM Specifications *continued*

Laser parameters	
Type	Semiconductor Laser GaA1As
Wave length	780 +/- 25 nm
Divergence angle	53.5° +/- 1.5°
Output power	0.14 mW
Operating conditions	
Temperature	5° to 45°C (41° to 113°F)
Humidity	5% to 90% (10% to 80%)

Wide Ultra2 SCSI Hard Drives

Table 5-5
Non-Hot-Plug Wide Ultra2 SCSI Hard Drives

	18.2-GB	18.2-GB 10-K	9.1-GB	9.1-GB 10-K
Capacity	18,209.3-MB	18,209.3-MB	9,100.0-MB	9,100.0-MB
Height	25.4-mm (1-inch)	25.4-mm (1-inch)	25.4-mm (1-inch)	25.4-mm (1-inch)
Width	88.9-mm (3.5-inch)	88.9-mm (3.5-inch)	88.9-mm (3.5-inch)	88.9-mm (3.5-inch)
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI
Transfer rate synchronous (max)	80 MBps	80 MBps	80 MBps	80 MBps
Seek time (typical, including setting)				
Single track	0.8 ms	0.8 ms	1.9 ms	0.8 ms
Average	6.9 ms	5.7 ms	7.5 ms	5.4 ms
Full stroke	15.0 ms	12.2 ms	15.0 ms	12.2 ms
Rotational speed	7,200 rpm	10,000 rpm	7,200 rpm	10,000 rpm
Physical configuration				
Bytes/sector	512	512	512	512
Logical blocks	35,566,080	35,566,080	17,773,524	17,773,524
Operating temperature				
Celsius	10° to 35°	10° to 35°	10° to 35°	10° to 35°
Fahrenheit	59° to 95°	59° to 95°	59° to 95°	59° to 95°

Table 5-6
Hot-Plug Wide Ultra2 SCSI Hard Drives

	18.2-GB	18.2-GB 10-K	9.1-GB	9.1-GB 10-K
Capacity	18,209.3-MB	18,209.3-MB	9,100.0-MB	9,100.0-MB
Height	25 4-mm (1-inch)	25.4-mm (1-inch)	25.4-mm (1-inch)	25.4-mm (1-inch)
Width	88 9-mm (3 5-inch)	88.9-mm (3.5-inch)	88.9-mm (3.5-inch)	88.9-mm (3.5-inch)
Interface	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI	Wide Ultra2 SCSI
Transfer rate synchronous (max)	80 MBps	80 MBps	80 MBps	80 MBps
Seek time (typical, including setting)				
Single track	0.8 ms	0.8 ms	0.8 ms	0.8 ms
Average	6 9 ms	5.7 ms	7.9 ms	5.4 ms
Full stroke	15 0 ms	12.2 ms	16.0 ms	12.2 ms
Rotational speed	7,200 rpm	10,000 rpm	7,200 rpm	10,000 rpm
Physical configuration				
Bytes/sector	512	512	512	512
Logical blocks	35,566,080	35,566,080	17,773,524	17,773,524
Operating temperature				
Celsius	10° to 35°	10° to 35°	10° to 35°	10° to 35°
Fahrenheit	59° to 95°	59° to 95°	59° to 95°	59° to 95°

Compaq NC3163 Fast Ethernet Embedded NIC

Table 5-7
Compaq NC3163 Fast Ethernet Embedded NIC

Network interface	10Base-T/100Base-TX
Compatibility	IEEE 802.2, 802.3, 802.3u
Data transfer method	32-bit, PC 33-MHz bus master
Network transfer rate	10/100 Mbps
Connector	RJ-45
I/O address and interrupt	Plug and Play PCI
Compliance	PCI 2.2 and 2.1
OS support	Microsoft Windows NT 4.0, Novell NetWare 5.x Server, Novell NetWare 4.x Server, Novell NetWare 3.x Server, SCO UnixWare 7.x, SCO OpenServer 5.0.5

Dual Channel Wide Ultra2 SCSI Adapter

Table 5-8
Dual Channel Wide Ultra2 SCSI Adapter

Protocol	Wide Ultra2 SCSI, Wide Ultra SCSI-3, Fast-Wide-SCSI-2 and Fast SCSI-2
Compatibility	All PCI server configurations are backward compatible with Fast, Fast-Wide SCSI-2, and Wide Ultra SCSI-3 devices
Drives supported	Up to 7 SCSI devices per channel
Data transfer method	32-bit PCI bus-master
Maximum transfer rate per PCI Bus (peak)	133 MBps
SCSI channel transfer rate	80 MBps
SCSI termination	Active termination
SCSI connectors	1 external, 2 internal (68-pin)

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